

CESDR logo design contest on

Members of the College of Engineering Community of DLSU are invited to join the CESDR logo design contest. Contest mechanics are as follows:

The contest is open to all members of the College of Engineering community (undergraduate and graduate students, faculty, staff)

1. The logo must depict theme: "Engineering and Sustainable Development for Industry Competitiveness".
2. The design may be drawn either by free hand using any medium or by computer or both free hand and computer. The size must be 2"x 2" using a maximum of 3 colors drawn in short bond paper with the rationale (less than 100 words) legibly written below the design.
3. The design of the logo must be certified original and/or officially submitted by the participant.
4. Please submit entries to Velasco Rm. 102. Please indicate name of participant, position in COE community, the department represented and contact information.
5. Deadline for submission of entries is on December 15, 2005.
6. Winners will be posted on the bulletin board at Velasco 102 on January 4, 2005. The prizes are as follows: Grand prize: PhP 1,000.00 and three (3) consolation prizes.

For more information, you may contact the sustainable technology laboratory (V-102) at local 275.

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4 engineering graduate fellows named

The Graduate Fellowship program at De La Salle University-Manila is a scholarship program under the Office of the Vice President for Academics and Research, which only began last school year 2004 – 2005. It is an opportunity for graduate students who wish to pursue full-time studies in the university either in the MA/MS programs or in the PhD programs. It provides the graduate fellow full financial support in tuition and fees with book allowance every term plus an allowance every month. In return, the fellows are expected to render assistantship through teaching or research in their corresponding departments and are not to engage in any other work either full time or part time during the fellowship. A fellow is also expected to render service in any unit within the DLSU system once the degree being pursued is completed.

When it began in 2004, only 15 slots were available for highly qualified candidates in the entire University. The screening for graduate fellowship is very competitive and each candidate must undergo intensive screening. Currently only 7 students in the entire university have been entitled with the grant, 4 of which come from the College of Engineering (COE), namely: Liezzel Aquino (PhD-ChE), Kathleen Aviso (MS-EnviEng), Dennis Yu (MS-ChE) and J.B. Manuel Biona (PhDME).

For more information on the graduate fellowship please contact the Office of the VPAR at (02) 5244611 local 108 or 109.

S.A.G.E.S. Infobits

(Students Association of Graduate Engineering Studies)

Upcoming Lecture Series

The Students Association of Graduate Engineering School (SAGES) will be sponsoring a lecture series this second trimester. List of programs are provided as follows:

1. "How To Write and Present a Conference Paper" by Dr. Joseph Aurenesia – October 26, 2005 at V-210
2. "How To Find and Submit Proposals for Research Grants and Sandwich Programs" by Dr. Alvin Culaba - Schedule to be arranged
3. "How To Write and Publish A Scientific Paper" by Dr. Raymond Tan - Schedule to be arranged



TECHNOLINK

A trimestral publication of the Center for Engineering and Sustainable Development Research (CESDR)
November 2005 Vol.1 No.1

Digest

What's inside:

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COE marks 2 decades of partnership with industry

Linkage services goes on-line Nov. 9

Close to two decades of industry support to the programs of the College of Engineering has produced outstanding engineering graduates who are technically competent beaming with confidence and good personal relations. It has also strengthened the COE student and faculty researches through provision of real-world problems and technical solutions. The College of Engineering, in the process, has been conferred Centers of Excellence (COE) and Centers of Development (COD) in five disciplines by the Commission on Higher Education (CHED), two of them lone ones in the country, namely, chemical and mechanical engineering. The other COE is the electronics and communications engineering (ECE) while CE and IE are CODs.

Currently, there are more than 150 linkage-member companies that provide on-the-job (OJT) training of undergraduate and graduate students and faculty, collaborative research or projects, consulting and training services as well as resource persons to local seminars and conferences. In the first term of this school year alone, 282 undergrad students successfully completed their OJT in more than 70 companies/organizations. The post-OJT survey revealed that both students and companies benefited significantly from their 3 months (for CE, ChE, ECE, IE, and ME) and 12 months for MEM industry exposure. Results of the said survey shall be made available also on-line.

Meanwhile, to keep the companies informed of the various linkage activities, a website has been developed for them to access its services on-line. Among these are posting and application of OJT needs and requirements, feedback information, job and career postings, the CESDR technolink digest which highlights the COE research and technology innovation, on-going these projects, upcoming events such as exhibitions, lectures of visiting professors and scientists from abroad, as well as future COE plans where companies could participate in. The website is <http://www.coelinkage.dlsu.edu.ph>.

DLSU appoints CESDR honorary professors

Six distinguished foreign scientists make up the first batch of newly appointed honorary professors at the Center for Engineering and Sustainable Development Research (CESDR) effective June 2005. This Honorary Professorship Program of the College of Engineering was launched last March 2005 aimed at strengthening the knowledge and scientific base of the Center and enhances competitiveness in securing externally-funded research projects. These professors were selected on the basis of their expertise and commitment to the COE-CESDR that merited such recognition. They are:

1. Professor Toshio Fukuda of Nagoya University, Japan - Mechano-Informatics and Systems (www.nagoya-u.ac.jp)
2. Professor Kaoru Hirota of Tokyo Institute of Technology, Japan - Information Technology (www.titech.ac.jp)
3. Professor Oussama Khatib of Stanford University, USA - Robotics (www.stanford.edu)
4. Professor Jong-Hwan Kim of Korea Advanced Institute of Science and Technology, South Korea - Robotics and Humanoid (www.kaist.ac.kr)
5. Professor Raouf Naguib of Coventry University, United Kingdom - Biomedical Engineering and Bioinformatics (www.coventry.ac.uk)
6. Professor Mike Purvis of Portsmouth University, United Kingdom - Energy and Environment (www.port.ac.uk)



Honorary professors during the launching last March 2005 at DLSU-Manila. From left: Profs. Hirota, Kim, Naguib and Purvis. Not in photo are Profs. Fukuda and Khatib. (Photo courtesy of MCO)

Environmental researches get NAST recognition for second straight year

The DLSU College of Engineering is recognized for its research excellence in the area of environmental technology and management with industrial applications. In the past two years, four prominent professors bagged major awards given annually by the National Academy of Science and Technology (NAST). Last July 2005, Dr. Pag-asa Gaspillo, current COE Dean received the Hugh Greenwood for Environmental Science Award for her significant contribution to domestic and industrial water and wastewater treatment. Dr. Joseph Auresenia, an Associate Professor of Chemical Engineering, received this year's Outstanding Scientific Paper award for his work on ultrasonic cleaning machine for a new and very dirt-sensitive plastic product. In 2004, Dr. Raymond Tan, Associate Professor of Chemical Engineering and current Graduate Studies Director and Dr. Alvin Culaba, Professor of Mechanical Engineering and CESDR and Linkage Director, shared the same award for their outstanding work on Life Cycle Assessment (LCA). Dr. Tan, likewise, was 2004 NAST Outstanding Young Scientist (OYS) in Mechanical Engineering and cited in the NAST-Du Pont Talent Search for Young Scientist in the same Awards.

COE gears up for biomedical engineering research for hospitals

The Biomedical Engineering Program at the College of Engineering, De La Salle University-Manila is offered under the supervision of Manufacturing Engineering and Management Department (MEM) and in partnership with De La Salle - Health Sciences Campus in Dasmarias Cavite. The program is officially called, Bachelor of Science in Manufacturing Engineering and Management with specialization in Biomedical Engineering (MEM-BME). The MEM-BME program has received financial support from the European Commission through its ASIA Link Programme to strengthen the capability to undertake research and to develop professionals concerned with the application of appropriate technology for the efficient delivery of healthcare services and for the advancement of methods used for diagnosis, therapy and rehabilitation. Dr. Julius B. Maridable, the former dean of the College of Engineering and currently the Vice-President for Academics and Research was very instrumental in establishing the Biomedical Engineering course at DLSU-M and he is also the current Local Project Manager. This project is in partnership with the University of Pisa in Italy, Royal Institute of Technology in Sweden and the University of Indonesia in Jakarta.

Biomedical Engineering experts from these partner-institutions visit DLSU-M and deliver intensive training modules for capacity building to faculty members, practitioners both in private and government aimed at improving their competence in teaching and providing efficient delivery of healthcare services in the country. Professors Mannan Mridha and Gunnar Nihlen from the Royal Institute of Technology (KTH), Sweden conducted the first two biomedical engineering courses at DLSU-Manila last August 2005. The project also seeks to promote the exchange of best practices in biomedical and clinical engineering courses among the partner institutions. In fact, a number of faculty members from the College of Engineering will be sent to Italy and Sweden for short training and international exposure starting in January next year. For more details contact Dr. Nilo T. Bugtai, the Chair of the MEM Department and the Deputy Local Project Manager at local 524-4611 local 244.

DOE adopts CESDR bioethanol study

The Department of Energy presented the results of the bio-ethanol study undertaken by CESDR to the various stakeholders such as the transport, fuel, and sugar industry sectors. The study revealed that ethanol derived from sugarcane and molasses are the most viable feedstocks for ethanol production in the Philippines. It further confirms that when blended with gasoline up to 10% (E10), no engine modifications are needed; yet it enhances octane rating and reduces toxic emissions. It also provides superior engine performance by preventing engine deposits. The study suggested that the fuel ethanol supply chain must be optimized in order to maximize the energy independence benefits and foreign currency savings of the program. These measures include the use of large, integrated production facilities with adequate economies of scale; cogeneration facilities and waste reuse or recycle to minimize adverse environmental impacts. CESDR was tapped by the United States Agency for International Development (USAID) to conduct the techno-economic study of ethanol as an alternative fuel as basis for the National Fuel Ethanol Program known also as the Bioethanol Fuel Act of 2005. The research team consisted of Dr. Alvin Culaba (ME), Dr. Raymond Tan (ChE), Joel Tanchuco (Econ.) and Alex Fillone (CE).



COE Administrators (As of First Term, SY 2005-06)

Dean: : Dr. Pag-asa D. Gaspillo
Vice-Dean: : Engr. Efren G. de la Cruz
Director, CESDR and IndustryLinkage : Dr. Alvin B. Culaba
Director, Graduate Studies and Research : Dr. Raymond R. Tan
Director, Product Dev't. and Innovation : Dr. Elmer P. Dadios

Department Chairs

Civil Engineering : Engr. Ronaldo Gallardo
Chemical Engineering : Dr. Leonilla Abella
Electronics and Comm. Engineering : Engr. Antonette Roque
Industrial Engineering : Mr. Dennis Beng Hui
Manufacturing Eng'g. and Management : Dr. Nilo Bugtai
Mechanical Engineering: Dr. Manuel Belino

Linkage Coordinators

Civil Engineering : Engr. Jason Ongpeng
Chemical Engineering : Dr. Raymond Tan
Electronics and Comm. Engineering : Engr. Oswald Sapang
Industrial Engineering : Mr. Dennis
Manufacturing Eng'g. and Management : Ms. Phyllis Lim
Mechanical Engineering : Engr. Efren de la Cruz

From the Dean's Desk



The College of Engineering Faculty Research

The faculty of the College of Engineering is characterized by a rich diversity of research activities and interests. Research remains a primary emphasis for the faculty in its vision to achieve excellence in research and a resource of new knowledge.

The faculty is organized according to the research agenda set by the College represented by its six departments – Chemical Engineering, Civil Engineering, Electronics and Communications Engineering, Industrial Engineering, Manufacturing Engineering and Management, and the Mechanical Engineering.

The College of Engineering is committed to cultivate a strong research culture by maintaining the high quality of faculty members, developing international linkages with researchers here and abroad, and strengthening resources for research within the college.

The faculty of the College is shifting its gear towards multidisciplinary projects with an aim of bringing together the faculty experts from the various departments within the college and other universities in order to motivate the faculty to produce high quality research.

The faculty of the College is proud of its achievements in research. Looking ahead, the College of Engineering has set goals and challenges in order to nurture a vibrant research culture even with a limited resource. The faculty will continue to disseminate its research findings through seminars, public lectures, and research publications.

*Dr. Pag-asa D. Gaspillo
Dean, College of Engineering*



IE department assists BIR on tax collection system

A team of faculty from the Industrial Engineering (IE) Department is tasked to assist the Bureau of Internal Revenue (BIR) in improving their tax verification drive. The general objective of the project is to have a seamless integration between the Tax Compliance Verification Drive (TCVD) and the Mobile Revenue Officers System (MROS). In addition, the project also looked at how electronic Sales (E-SALES) and information from the cash registration machines (CRM) and Point of Sales (POS) equipment registration can be integrated into MROS. The deliverables of the project include a detailed process map of the TCVD process together with recommendations on where and how to integrate E-SALES and CRM/POS. The project was also able to identify critical areas that are crucial to the TCVD process as well the deployment strategy. The project team is composed of Mr. Dennis Beng Hui and Ms. Jenny Gutierrez who can be contacted at (02) 5244611 local 220.

CROSSWORD PUZZLE

The first one to answer correctly the puzzle, and submit the same to the CESDR Office at Miguel Mezzanine 113 wins a prize!

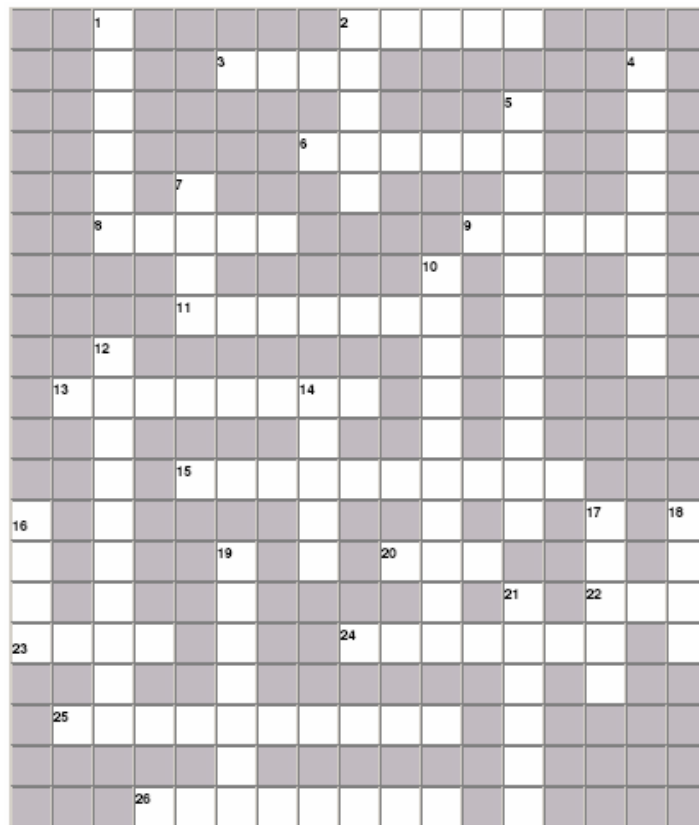
Down:

1. a mixture of gas from natural gas studied by one of the AUNSEED-net scholars
2. Students Association of Graduate Engineering School
4. The theory and application of robots used by ARPET as non-incineration method of degrading PCBs
7. national academy of science and technology
10. a newly open field in engineering related to healthcare
12. the concern of biomedical engineering
14. research group who conducted the bioethanol project
16. means to adhere
17. developed concept of fuzzy sets
18. Bioethanol ____ Act of 2005
19. an alternative fuel for gasoline derived from crops
21. the honorary professor from Nagoya University, Japan

Across

2. one of the exhibits joined by COE
3. Japan International Cooperation Agency
6. company that pioneers in adhesive technology development
8. a type of evolutionary intelligence used in optimization
9. a fund given to research bodies usually by the government
11. a design for experiment method used for optimization which won DLSU a NAST award
13. an act of exploring new ideas through experimentation and mathematical methods

15. a JICA funded scholarship program for ASEAN graduate students
20. polychlorinated biphenyls
22. Department of Energy
23. Dr. Pag-asa Gaspillo
24. the act of disturbing the environment by emitting hazardous wastes
25. the name of this research digest
26. raw material for bioethanol derived from the extracts of sugarcane



Editorial

SOFT SOLUTIONS TO HARD PROBLEMS

With international oil prices reaching record levels in recent months, the general public has become acutely aware of energy issues. The Philippine government has responded by launching programs to develop various alternative fuels – in particular, natural gas, biodiesel and ethanol. These programs have ignited a raging debate on the merits and pitfalls of these alternatives.

In the information age, it is only fitting that significant research effort is being put into using intelligent computational techniques to address these growing environmental problems. The use of mathematical or computer models to simulate the interactions of technology with the environment sometimes yields counterintuitive solutions not immediately evident from a layman's perspective. For example, Kreith and West's recent article in the *Journal of Energy Resources Technology* dispels many of the myths of the much-touted hydrogen economy envisioned by today's energy specialists as the foundation of energy infrastructure for transportation in the future. Using straightforward life cycle-based thermodynamic arguments, the paper concludes that many of the proposed fuel hydrogen production and delivery systems, particularly those that rely indirectly on fossil fuel feedstocks, are actually less efficient – and consequently more environmentally damaging – than conventional systems in use today. Many similar environmental issues can be addressed through the use of mathematical modeling. Mathematical models are intended to provide humans with simplified versions of reality to facilitate understanding of its behavior. Some resolution is inevitably lost in the process of translating real systems into a set of mathematical expressions or a computer code. The words of Zadeh, who developed the concept of fuzzy sets in the 1960s, summarize this dilemma:

“As the complexity of a system increases, our ability to make precise and yet significant statements about its behavior diminishes until a threshold is reached beyond which precision and significance (or relevance) become almost mutually exclusive characteristics.”

This dilemma is central to the practice of the judicious use of mathematical models in support of real-life decision-making. On the other hand, models provide a means of elucidating the fine points of policy decisions whose consequences may be felt for decades to come. (Excerpts from *Philippine Star* dated September 2005)



Director's Corner



Technolink Digest is envisioned to provide companies and international partners and stakeholders with recent information on the most recent scientific research and technological innovations of faculty and students of the College of Engineering through its Center for Engineering and Sustainable Development Research (CESDR).

This trimestral publication shall be made accessible on-line within the Linkage Website. It is hoped that through this, companies can pick up ideas where collaborative research and consulting work could be initiated and undertaken with faculty. Successful research/project studies with industrial relevance shall be featured in future issues of the Digest.

I acknowledge the hard work of the editorial staff and the linkage coordinators for coming up with this maiden issue, and hope that this could be sustained to achieve its goals and objectives. For more information, contact us at (02) 5244611 loc 273.

Dr. Alvin B. Culaba, CESDR Director

DLSU College of Engineering Joins Industry Exhibits

The College of Engineering of DLSU through its Industry Linkage Office had participated in a number of exhibits to promote its curricular and research programs. The exhibits participated include the Semiconductor and Electronics Industry in the Philippines Inc. held at the Philippine International Convention Center (PICC), the National Academy of Science and Technology Annual Scientific Meeting held at the Manila Hotel, Science Week Exhibit organized by DOST and held at the Philippine Trade and Training Center (PTTC) and the Industry Linkage Exhibit held also at PTTC. For more information, the Linkage Office can be contacted at Tel (02) 5244611 loc 217 or Tel/Fax (02) 5240563.



Dr. Tan and some DLSU undergraduate and graduate students at the Industry Linkage Exhibit held at PTTC



DLSU Booth at the SEIPI Exhibit held at PICC last July 2005 (Photo taken by L. Aquino)



Dr. Culaba discussing with some industry people during the SEIPI exhibit (Photo taken by K. Aviso)

Size Effect of RC Beams Predicted Using Neural Network

Recent studies on beams of larger depths have shown that as the size of the beam increases, the intensity of shear stress decreases especially in lightly reinforced beams. This observation contradicts the assumption given by some design codes like the shear equations of the American Concrete Institute (ACI) and the National Structural Code of the Philippines (NSCP). With this, Dr. Andres Winston Oreta, Professor of Civil Engineering, has recognized the need to reanalyze existing data and develop a model which could provide better shear capacity models of RC beams and provide a better understanding of shear problems and the different parameters affecting it including size effects. He developed an artificial neural network (ANN) model using existing experimental data on shear failures of slender RC beams without web reinforcements. The model provides reasonable predictions of the ultimate shear stress and can simulate the size effect on ultimate shear stress at diagonal tension failure.

Recognizing the significant contribution of the study to shear failure research, the Commission on Higher Education (CHED) has recognized Dr. Oreta's work as this year NCR-II Republica Award. He can be contacted at his e-mail address: oretaa@dlsu.edu.ph.

Particle Swarm Optimization technique for pollution prevention

A recent research project demonstrated the use of particle swarm optimization to develop waste management strategies for manufacturing facilities. The algorithm is based on social animal behavior and is able to identify optimal mitigation measures from an array of technology options. The results of the study was presented at the recent inaugural lecture of the Jaime V. Ongpin distinguished professorial chair in Control Engineering conferred to Dr. Raymond Tan, who is also an associate professor of chemical engineering. His e-mail is tanr_a@dlsu.edu.ph.

ARRPET-DLSU develops innovative PCB treatment process

The Stockholm Convention, which calls for the outright banning and destruction of twelve (12) persistent organic pollutants (POPs), has identified Polychlorinated biphenyls (PCBs) as one of these 'dirty dozen'. PCBs are toxic to fishes and vertebrates and human exposures to these substances have resulted in liver dysfunction, dermatitis and dizziness. PCBs, which are used as coolants, dielectric fluids, inks, paints, pesticides and as protective coatings for wood, are resistant to thermal degradation and have a high degree of chemical stability. Because of its stability, PCBs can only be degraded by incineration or ultraviolet (UV) technology.

The Asian Regional Research Programme on Environmental Technology – De La Salle University (ARRPET-DLSU), which is funded by the Swedish International Development Cooperation Agency (SIDA), has developed a non-incineration technology for the treatment and degradation of Polychlorinated biphenyls (PCBs) within its first four years during its first phase (January 2001 – December 2004). They utilized a sequential chemical-biological treatment process using UV light in the presence of hydrogen peroxide (H_2O_2) (UV/ H_2O_2 system) and a 3-phase fluidized bed biofilm reactor. This process enables PCB degradation at ambient temperatures and enhances treatment with efficiencies reaching as high as 90%.

Currently, ARPET-DLSU is in the process of linking up with industries for the possible application of the technology on a pilot-plant scale. The project is now in its second phase ending in December 2007. Dr. Susan Gallardo is the Project Director and can be reached at (02) 5244611 loc 214, 215.

AUN scholars complete research

The Chemical Engineering Department hosts scholars from the ASEAN University Network (AUN) who wish to pursue master's or PhD degrees in chemical engineering (ChE) under the AUN - Support for Engineering Education Development (AUN/SEED) Programme of the Japan International Cooperation Agency (JICA). Five students from Indonesia and Vietnam have recently completed their graduate researches at DLSU-Manila, namely:

Ms. Thuy Phuong Thi Pham
Ho Chi Minh University of Technology, Vietnam
"Vapor-Liquid Equilibria of Acetone-Toluene-Water System in the Presence of Sodium Chloride and Cupric Chloride"

Mr. Long The Nam
Ho Chi Minh University of Technology, Vietnam
"Preparation and Activity of Ni-MgO/a-Al₂O₃ Catalyst in the Partial Oxidation of Methane"

Mr. Chau Van Dinh
Hanoi University of Technology, Vietnam
"Design, Fabrication and Testing of Microwave Pyrolyzer for Low-Density Polyethylene and Polypropylene Medical Wastes"

Mr. Dang Son Van
Hanoi University of Technology, Vietnam
"Modeling the Behaviour of a Reverse-Flow Catalytic Autothermal Fixed-Bed Reactor for Production of Synthesis Gas Using Methane Partial Oxidation"

Mr. Anton Purnumo
University of Gadjah Mada, Indonesia
"Preparation and Surface Characterization of Nickel Catalyst on Various Support Materials for Low Temperature Steam Reforming of Methane"

Currently, there are 10 graduate students from 6 AUN-member countries enrolled in the ChE Program. For more information about the AUNSEED-net, please contact Dr. Leonila Abella at (02) 5360257 or at loc 222.

Fuzzy Logic Controller for Micro-Hydro Systems

Micro-hydro power systems independently supplying electricity to small networks have inherent problems on stability caused by variations in the electrical load. Line frequency can fluctuate as a result of sudden change in the electrical load; and line voltage fluctuation follows. These unwarranted fluctuations are detrimental to household appliances and devices, which was the focus of research of Mr. Laurence Gan Lim and Dr. Elmer Dadios at the College of Engineering. They developed a fuzzy logic-based microcontroller for cross flow turbine speed. The study implemented a fuzzy logic control system in a laboratory scale of a micro-hydro power plant, with a microcontroller as the main processing unit. The control system was able to maintain a generator frequency of 60 hertz with a tolerance of ± 2 hertz. The controller also showed stringency as it never allowed the frequency to go beyond the limits of 65 and 55 hertz, with an average stabilization time of 3.7045 seconds under load variations from 11.11% to 88.88% of the full load. DLSU through its Center for Micro-Hydro Technology for Rural Electrification (CeMTR) has been in Micro-Hydro technology research for more than 8 years now. For more information, please contact its Project Leader, Engr. Godofredo Salazar, at (02) 5244611 local 273.