

CIVIL ENGINEERING RESEARCH EXCHANGE SYMPOSIUM 2012

CERES' 12

PROCEEDINGS

2nd July 2012.

Faculty of Engineering, University of Ruhuna.



CERES' 12



Organized Jointly by the Civil Engineering Societies of the
University of Ruhuna, University of Peradeniya and University of Moratuwa

PROCEEDINGS OF THE
CIVIL ENGINEERING RESEARCH EXCHANGE SYMPOSIUM
(CERES' 12)
02nd July 2012
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MESSAGE FROM THE VICE-CHANCELLOR, UNIVERSITY OF RUHUNA



It gives me great pleasure to send this message of felicitation to the “2nd Civil Engineering Research Exchange Symposium (CERES 2012)” organized by the Departments of Civil Engineering of the Faculties of Engineering at the Universities of Ruhuna, Peradeniya and Moratuwa to promote research interests among final year engineering students. It is a privilege for the Faculty of Engineering, University of Ruhuna to host this symposium this year.

As one of the fast-emerging Faculties of Engineering in Sri Lanka, I am indeed proud of the achievements of our engineering faculty. I am sure that this endeavor will generate increasing emphasis on the non-engineering soft skills of our engineering graduates. As tomorrow’s leaders in the field of engineering, the students will have to have skills in leadership, and development of personality and confidence in the highly competitive society of the future.

With increasing emphasis on Sri Lanka becoming a centre for innovations and technology, as well as the expectations of an emerging middle income country, the engineering graduates need to be fully equipped to face the daunting challenges of the future. I believe that it is encouraging for the final years students of Civil Engineering to have many academic staff and representation from industry for this important event.

Therefore, I believe that this initiative is timely and opportune. I wish the symposium every success.

Prof. Susirith Mendis
Vice-Chancellor
University of Ruhuna

MESSAGE FROM THE DEAN, FACULTY OF ENGINEERING, UNIVERSITY OF RUHUNA



It is with great pleasure that I send this message to the Second Civil Engineering Research Exchange Symposium (CERES 2012) to be held on 2nd and 3rd July 2012 at the Faculty of Engineering, University of Ruhuna.

Undergraduate research is an important element within the engineering curriculum. The Faculty of Engineering, University of Ruhuna have already taken positive steps to strengthen the research facilities in the respective laboratories. In addition, Department of Civil and Environmental Engineering offers modules on Research Methodology, Advanced Topics in Civil Engineering, and Comprehensive Design Project etc. for preparing the undergraduates for the research culture. Amidst all these efforts taken by the Faculty and Department levels, the initiative taken to organise annual research symposium by all Civil Engineering departments through their student societies is very valuable to showcase students' research findings. This will encourage the final year students to conduct quality research where outcome could be published at the symposium. Also, this event will be a good forum for civil engineering students and staff of all Engineering Faculties to share their research ideas, findings and also could develop close friendships.

I thank all Heads of Departments of Civil Engineering for agreeing to hold this symposium at the Faculty of Engineering, University of Ruhuna. I also appreciate the effort of Civil and Environmental Engineering Society with the advice of Head and other academic staff for organizing the symposium and other related activities. I wish all the very best for a fruitful symposium.

Dr. A.M.N. Alagiyawanna
Dean/ Faculty of Engineering
University of Ruhuna
Hapugala, Galle.

**MESSAGE FROM THE HEAD,
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING,
UNIVERSITY OF RUHUNA**



It is with great pleasure that I issue a message to the CERES 2012, second of this kind organized by the students of the Departments of Civil Engineering in our university system. I am very pleased to note that, this time it is organized by Civil and Environmental Engineering Society of the University of Ruhuna and will be hosted at the Faculty of Engineering, University of Ruhuna. Often we see symposiums coming from nowhere and then slipping into oblivion, especially, when it is supposed to be organized by different institutes in rotation. In this respect, it is really encouraging to note the progress of CERES, from the CERES 2010 organized by Civil Engineering Society of the University of Peradeniya to CERES 2012 organized by the Civil and Environmental Engineering Society of the University of Ruhuna. I am sure that the students of the University of Moratuwa are now keen to complete the full cycle to start it all over again from Peradeniya. All this have become possible with the students determination to coexist as civil engineers graduates/ undergraduates with a common identity. It also sends out a strong message that more collaboration are required between the three departments of Civil Engineering, something, perhaps we have not realized as independent institutes.

CERES presents a unique opportunity for the students of all three faculties of engineering to showcase their research and to initiate future collaborative work between the departments. It also provides the students with an opportunity to sharpen their soft skills in a friendlier and more cordial atmosphere. Engineers are often blamed for not taking their due place in the society and for shying away from leadership roles and public speaking. It is the duty of all academic institutions to make sure that this stigma associated with the professional engineers is refuted, and our graduates possess right attributes when they graduate. Forums of this kind provide opportunity to help our graduates to groom their soft skills and boost their confidence. CERES also sends a strong message on the importance of research and development in the undergraduate program and the importance of inculcating the learning to learn skills in rapidly changing world.

As the host of the CERES 2012, I shall take this opportunity to thank the most exclusive sponsor of the event “Tokyo Cement Group (PLC) Ltd”. It is understood that Tokyo cement has been the steadfast supporter of this event from its inception. The full sponsorship by the “Tokyo Cement Group (PLC) Ltd” is a source of inspiration for us all to stage this symposium with great success year after year. I shall also take this opportunity to thank the Civil and Environmental Engineering Society of the University of Ruhuna for taking the initiative to organize the event and especially, Ms. Thushara Wickramaarachchi and Dr. Sudhira De Silva, the Senior Treasurer (Academic) and the Advisor of the society. I wish all the success for CERES 2012 and hope it will continue to be in our calendar for many more years to come.

Dr. Harsha Sooriyaarchchi

Head, Department of Civil and Environmental Engineering,
University of Ruhuna.

**MESSAGE FROM THE HEAD,
DEPARTMENT OF CIVIL ENGINEERING,
UNIVERSITY OF MORATUWA**



It is with pleasure that I issue this special message to congratulate the CERES 2012 symposium organized for the second time. It is a realization of a distant dreams that now we see a great deal of harmony and collaboration among the engineering faculties of Sri Lanka. It is heartening to note that such collaborative initiatives have been carried out as annual events so that we will be able to see the cordial relationships among faculties fostering every year.

It is also an important event from the point of view of the changes that are happening in the undergraduate engineering education. With the adoption of Outcome Based Education (OBE) coupled with semester system and also in order to fulfill the needs of various accreditation bodies (both national and international), it is essential to improve the research culture and also to inculcate the habits of lifelong learning among the undergraduates. In this context, CERES can be considered as a landmark achievement that will bring immense benefits to the undergraduates and also a significant encouragement to work with dedication and commitment for the studies.

Being a small country with few engineering faculties that produce world class graduates with a superior intake of students after GCE Advanced Level examination, it is essential to have a significant level of collaboration and resource sharing among the engineering faculties while ensuring the good practices of one university if adopted by the others. In this context also, CERES can provide valuable opportunities for the undergraduates to get to know each other to have strong friendships though they are studying in different universities.

With all these positive indicators and achievements, I am sure CERES will be fulfilling a long felt need for the engineering faculties of our university system.

I hope that the culture that is started by the Civil Engineering Societies will become a faculty based collaboration in years to come with symposia of multi-disciplinary nature bringing bigger benefits and a greater degree of collaboration. I wish CERES all the success and wish to congratulate the organizers, lecturers, sponsors and others who have supported in various ways for their wholehearted efforts. I also wish a fruitful symposium for all the participants and hope it would lead to even bigger events of research collaboration in future.

Prof M T R Jayasinghe,
Senior Professor/Head,
Department of Civil Engineering,
University of Moratuwa.

**MESSAGE FROM THE HEAD,
DEPARTMENT OF CIVIL ENGINEERING,
UNIVERSITY OF PERADENIYA**



It is with great pleasure that I send this message to the 2nd Civil Engineering Research Exchange Symposium 2012 (CERES 2012) which is held on 2nd and 3rd July 2012. The objective of this Symposium is to provide a forum for the civil engineering students of the Faculties of Engineering at Peradeniya, Moratuwa and Ruhuna to discuss and exchange the results of their recently completed and ongoing research work. This will also provide an opportunity for the civil engineering students of the three Faculties of Engineering to establish and strengthen contacts among themselves. The symposium is not only a forum to highlight research work carried out in the respective departments and exchange information, but also an initiative for research collaborations among the departments. Greater interaction among the staff and students of our departments is indeed important today for further advancements of our research.

I take this opportunity to thank the Department of Civil and Environmental Engineering of the Faculty of Engineering, University of Ruhuna for organizing this very important event this year and look forward for a very successful symposium.

Prof.K.D.W. Nandalal

Head

Department of Civil Engineering

University of Peradeniya

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