



ICCESP 2021

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Proceedings of
**INTERNATIONAL WEB
CONFERENCE**
in Civil Engineering for a
Sustainable Planet

Editors

Seema K Nayar
Kavitha Madhu
Arun Baby Zacharia
Mohammed Thowsif
Sreeja Balakrishnan
Indu M S
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Seema K Nayar
Kavitha Madhu
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Kishor P
(Editors)

Proceedings of International Web Conference in Civil Engineering for a Sustainable Planet

ICCESP 2021 (5th – 6th March, 2021)

Organized by

Habilete Learning Solutions, Kollam, Kerala, India

In Collaboration with

American Society of Civil Engineers (ASCE)
TKM College of Engineering, Kollam, Kerala, India
Baselios Mathews II College of Engineering, Kollam, Kerala, India

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(ICCESP 2021) (05th-06th March, 2021)

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- Dr. Seema K. Nayar, Professor, Department of Civil Engineering, TKM College of Engineering
- Prof. Kavitha Madhu – TKM College of Engineering
- Prof. Arun Baby Zacharia – Baslios Mathews II College of Engineering
- Prof. Mohammed Thowsif – TKM College of Engineering
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ICCESP 2021

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ICCESP 2021

Foreword

Sustainable development has many facets. It encompasses environment restoration, social progress and economic growth. Infrastructural development through sustainable technologies deserves attention in order to promote prosperity while protecting the planet. Civil Engineering, considered to be the mother of all engineering disciplines, has always taken on itself the onerous responsibility of ensuring that the changes and innovations are in line with sustainable development. The International Conference in Civil Engineering for a Sustainable Planet (ICCESP 2021) focuses on addressing issues and concerns related to sustainability in all domains of Civil Engineering and attempts to present the research and innovative outputs in a global platform.

The conference aims to bring together leading academicians, researchers, technocrats, practitioners, and students to exchange and share their experiences and research outputs on all branches of Civil Engineering. It is also meant to provide a premier interdisciplinary platform to present and discuss the most recent innovations, trends, concerns and practical challenges encountered, as well as solutions adopted in the field of Civil Engineering. The conference proceedings shall act as the convergence of thoughts and of cutting-edge research outcomes in building a sustainable planet across geographic boundaries.

At this juncture, we place on record our sincere gratitude and appreciation for the untiring support and encouragement of all the members of the Advisory Committee, Scientific Committee and Organizing Committee. We also wish to thank the reviewers for striving to maintain the quality of the Conference and the Proceedings. Special thanks for the continuous support from the American Society of Civil Engineers (ASCE) and to Dr. Elias B. Sayah, the Region 10 Director and the Chief Patron of this Conference.

Dr. Seema K Nayar
Prof. Kavitha Madhu
Prof. Arun Baby Zacharia
Prof. Mohammed Thowsif
Dr. Sreeja Balakrishnan
Dr. Indu M S
Dr. Kishor P
(Editors)

About the Conference

The main aim of this conference is to bring together leading academicians, researchers, technocrats, practitioners and students to exchange and share their experiences and research outputs on all aspects of Civil Engineering. It will also provide a premier interdisciplinary platform to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the field of Civil Engineering.

Vision

To integrate the different facets of Civil Engineering by connecting the leading academicians, researchers, technocrats, practitioners, and students to share their knowledge and expertise. This conference fosters technological innovation and excellence in the field of Civil Engineering and its sustainable practises for the benefit of humanity.

Mission

- Understand worldwide advancements in the field of Civil Engineering through broad collaboration and sharing of knowledge.
- Enhance public understanding of sustainable engineering practises and pursue standards for their functional application.
- Foster possibilities for career and professional development.
- Motivate global audience by creating communities that develop technical interests, advise public policies, and spread awareness for the benefit of humanity.

About ICCESP-2021 Organizer



Habilete Learning Solutions India Pvt. Ltd. is established in 2018 by six professionals each having over 20 years of national and international experience in different industries ranging from education, engineering, communication and information technology. The company is established with the key vision of educating professionals to be leaders in a modern community by acting as a creative agent for change and diversity. To cater to the needs of the current engineering market Habilete serves as a vibrant, innovative and creative hub of learning that never surrenders to conventions. Habilete delivers flexible education and training options, specialized in skill development that will help engineering students and organizations to maximize productivity and to achieve significant competitive advantage. Habilete is also specialized in organizing conference, webinars and seminars to cater to the student community.

About the Collaborative Partners



The American Society of Civil Engineers represents more than 150,000 members of the civil engineering profession in 177 countries. Founded in 1852, ASCE is the nation's oldest engineering society. ASCE stands at the forefront of a profession that plans, designs, constructs, and operates Society's economic and social engine – the built environment – while protecting and restoring the natural environment. Through the expertise of its active membership, ASCE is a leading provider of technical and professional conferences and continuing education, the world's largest publisher of civil engineering content, and an authoritative source for codes and standards that protect the public. The Society advances civil engineering technical specialties through nine dynamic institutes and leads with its many professional- and public-focused programs.



TKM College of Engineering

Affiliated to APJ Abdul Kalam Technological University

TKM College of Engineering, the first government-aided engineering college in the State of Kerala, was established by the great visionary and entrepreneur, Janab Thangal Kunju Musaliar. The

foundation stone of the college was laid in the year 1956 by Dr. Rajendra Prasad, the first President of Independent India. The college was formally inaugurated in 1958 by Prof. Humayun Kabir, the then Minister for Scientific and Cultural Affairs, Govt. of India. The college is run by the TKM Educational Trust, headed by Janab Shahal Hassan Musaliar. Affiliated to APJ Abdul Kalam Technological University, it is approved by the All India Council for Technical Education (AICTE), New Delhi. There are eight undergraduate and eight postgraduate programmes in different domains of engineering and architecture and a programme on Master of Computer Applications. The College is also an approved research centre for Mechanical and Civil Engineering. The college remains as an outstanding centre of excellence in Kerala, catering to the needs of higher education to all sections of society.



BASELIOS MATHEWS II COLLEGE OF ENGINEERING

ISO 9001: 2015 Certified, Reg No: SQ/ISO 9001/267



Baselios Mathews II College of Engineering (BMCE) is named after its

founder, the late H H Moran Mar Baselios Marthoma Mathews II, the sixth Catholicos of the East and the Malankara Metropolitan of Malankara Orthodox Church. He was also the first Chairman of the Institution. This renowned college is managed by Dr. C T Eapen Trust under Malankara Orthodox Syrian Church. The institution started functioning in 2002 with the monumental objective of promoting academic excellence and competence in students, especially in the fast-growing global domain of Engineering and Technology. Located in the picturesquely beautiful Muthupilakadu in Sasthamkotta in the Kollam district of Kerala, the college stands out for its magnificent buildings and ultra-modern infrastructure; a fascinating blend of architectural excellence and functional values. Baselios Mathews II College of Engineering, Sasthamkotta has been a forerunner and prime mover in imparting technical education in God's own country. Affiliated to Kerala Technical University, the self-financing Engineering College has grown by leaps and bounds since its inception. The college started with four undergraduate Engineering programmes with an intake of 240 students, has now metamorphosed itself into one of the best educational institutions in southern part of India with 6 Undergraduate Program, and One Postgraduate program in Computer Science and Engineering.

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Peer Review Policy

All manuscripts submitted to this conference are peer-reviewed following the procedure outlined below.

Primary Evaluation: A preliminary evaluation of the manuscripts are done by editors and the manuscripts having serious scientific flaws or outside the scope of the conference are rejected. The manuscripts are also checked for plagiarism. Manuscripts high on plagiarism are rejected at this stage. Authors are given opportunity to revise and resubmit manuscripts with language issues, grammatical errors and insufficient originality. Those that meet the minimum criteria are passed on to experts for review. Authors of manuscripts rejected at this stage is informed within 1 week of receipt.

Peer Review: This conference proceeding employs a single-blind review process, where the reviewer remains anonymous to the authors throughout the process. Reviewers are matched to the article according to their expertise. Reviewers are asked to evaluate the manuscript and prepare a review report as per the following.

- Originality of work.
- Whether the content is good for publication.
- Follows appropriate ethical guidelines.
- Has results that are clearly presented and supported in the conclusions.
- Proper referencing of previous relevant work.

Reviewers are requested to advise editors on accepting/rejecting the submitted paper. Along with that, they are requested to give suggestions or modifications to improve the quality of the paper.

After receiving the Review Report, the final decision on acceptance or rejection of the manuscript is made by the editors and is communicated to the author along with any recommendations made by the reviewers.

After the peer review process, 68 manuscripts were accepted for oral presentations. The committee and technical chairs would like to thank all the reviewers for their diligence and for contributing their time, effort, and technical expertise to the review process.

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23	Prof. Bushra M.A., Assistant Professor, Department of Civil Engineering, T.K.M. College of Engineering
24	Dr. Amal Azad Sahib, Associate Professor, Dept. of Civil Engineering, TKM College of Engineering, Kollam
25	Dr. Muhammed Siddik A., Assistant Professor, Dept. of Civil Engineering, TKM College of Engineering, Kollam
26	Prof. Athul Madhu, Assistant Professor, Dept. of Civil Engineering, TKM College of Engineering, Kollam
27	Dr. Veerabhadra Rotte, Assistant Professor, Dept. of Civil Engineering, Institute of Infrastructure Technology Research and Management, Gujarat
28	Mr. Krishnadas Perikamana, Assistant Engineer, LID&EW Section, Kalliassery GP
29	Mrs. Devu Surendran, Project Analyst, Ecofootforward Environmental Consultancy and Engineers Pvt. Ltd, Mumbai

Keynote Speakers

- Prof. Rajayogan Palanichamy, F. ASCE. President, ASCE India Section Southern Region
- Dr. Narayanan Neithalath, Professor, School of Sustainable Engineering and the Built Environment, Arizona State University
- Dr. Anusha S.P, Assistant Professor, College of Engineering, Trivandrum
- Dr. Susha Lekshmi, SERB-National Post Doctoral Fellow at IIT Delhi
- Simon Shim, P.E., Principal, Active Design Group, Newark, NJ, USA

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