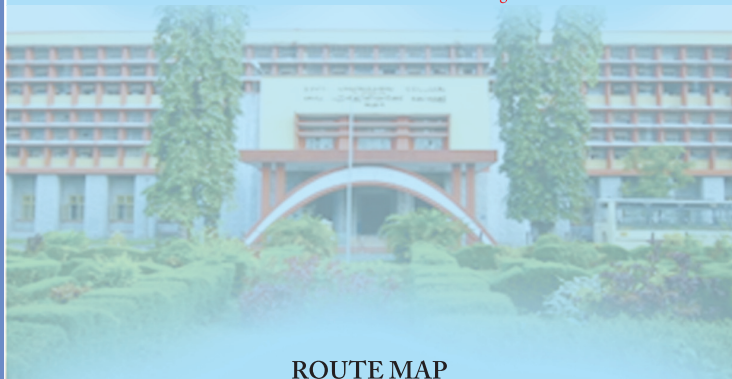


### ADDRESS FOR CORRESPONDENCE

The Co-ordinator (ICACHE – 2015)      Mobile : +919995894962 (Dr. Manju M.S.)  
Email : manjupradeep@gectcr.ac.in

The Organising Secretary (ICETEST - 2015)      Mobile : +919447442427 (Dr. Jayanand B.)  
Govt. Engineering College Trichur      +919447466287 (Dr. Vijayan P.)  
P. O. Govt. Engineering College      Ph. No. : +914872334144 (O)  
Thrissur, Kerala State, India      +914872336124 (Fax)  
PIN 680 009.      Email : icetest2015@gectcr.ac.in  
Web : www.icetest.gectcr.ac.in.



ROUTE MAP



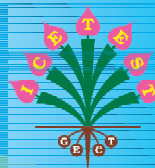
## INTERNATIONAL CONFERENCE ON ADVANCES IN CHEMICAL ENGINEERING (ICACHE – 2015)

December 9-11, 2015

Organized by

DEPARTMENT OF CHEMICAL ENGINEERING

Govt. Engineering College Trichur



Under the Aegis of  
the Fourth International Conference at  
Govt. Engineering College Trichur  
Thrissur 680 009, Kerala (St.), India

on  
**EMERGING TRENDS IN ENGINEERING, SCIENCE & TECHNOLOGY**  
(ICETEST – 2015)

[www.icetest.gectcr.ac.in](http://www.icetest.gectcr.ac.in).

Funded by Technical Education Quality  
Improvement Programme (TEQIP) - Phase II

## CONFERENCE THEME

Govt. Engineering College Trichur (GECT) has been organizing its biennial International Conference on the title theme 'Materials for the Future' (ICMF) since the year 2009, and the last conference under ICMF was held in the year 2013. The fourth International Conference in this series is being held from 9<sup>th</sup> to 11<sup>th</sup> December 2015, with the main conference theme having been revised to a broader and more comprehensive one, namely 'Emerging Trends in Engineering, Science and Technology' so as to cater to all disciplines of Engineering, Technology and supporting streams of Science. Accordingly, all the International Conferences henceforth organized in GECT would be titled 'International Conference on Emerging Trends in Engineering, Science and Technology-ICETEST', and would be materialized by the constituent international conferences organized by the major Engineering and Science Departments of the institution, on sub-themes of current interest and development in the respective disciplines. It is hoped that the broadened scope/regime of the revised title would enable the conference to bring together on to one platform the current advancements in all disciplines of studies under Engineering and Science, in which the host institution, GECT has established itself as a highly successful premier institution during the last over five decades. The ICETEST - 2015 will have eight constituent conferences; one each held in the Departments of Civil Engineering, Mechanical Engineering, Electrical & Electronics Engineering, Chemical Engineering, Electronics & Communication Engineering, Production Engineering, Computer Science & Engineering and School of Architecture, in the thrust areas of the respective disciplines.

The Department of Chemical Engineering, Govt. Engineering College Trichur on this occasion, announces the sub-theme 'International Conference on Advances in Chemical Engineering (ICChE - 2015)' under the umbrella of ICETEST - 2015.

## CONFERENCE OBJECTIVE

Chemical engineering applications have been a source of challenging research problems in the recent years. Advances in Chemical Engineering research have led to revolutionary changes in various facets of our day to day life. The objective of ICChE, the **International Conference on Advances in Chemical Engineering** is to address the ongoing evolutions in various fields of chemical engineering and to provide a platform to discuss and analyze state of the art advancements in Chemical Engineering Research and Development. The delegates from various realms of Chemical Engineering, comprising the academia, researchers and the industry experts can make use of this forum to exchange and validate ideas and share their experience.

The Conference Secretariat take this opportunity to request the whole hearted support and participation of researchers, practitioners, academia and all beneficiaries of 'International Conference on Advances in Chemical Engineering' by contributing research papers/articles and by attending the conference. The papers may be related to one or more of the topics listed in the Conference Topics.

## CONFERENCE TOPICS

ICChE - 2015 organized as part of ICETEST - 2015 will ensure deliberations on a slew of related topics which include the following

1. Catalysis and Reaction Engineering,
2. Functional Materials
3. Bioreactors and Bioprocesses
4. Sustainable and Green Technologies
5. Nanotechnology and Nanoscience
6. Mathematical Modelling and Simulation
7. Environmental Engineering
8. Renewable Energy Resources
9. Process Control and Automation
10. Transport Phenomena
11. Computational Fluid Dynamics

## CALL FOR PAPERS, GUIDELINES FOR SUBMISSION AND REGISTRATION

The prospective authors are called up on to submit full papers incorporating the original research work pertaining to the topics indicated above. The submission will be strictly online through the Website of ICETEST - 2015. The papers must provide a clear idea on the purpose of research, methodology used, major findings and relevant references, and shall not be already submitted/published/under consideration in any other conferences or journals. The guidelines and style of formatting to be adopted are given in the conference web site. Kindly visit the Conference Web Site at [www.icetest.gectcr.ac.in](http://www.icetest.gectcr.ac.in) for further details. It is mandatory for at least one author of an accepted paper to register for the conference. Only the papers of registered authors will appear in the journal. If an author has more than one accepted paper, each paper has to be registered.

The papers for ICChE - 2015 shall be submitted to **Track IV - Chemical Engineering: International Conference on Advances in Chemical Engineering – 2015**, out of the eight tracks provided in the web site of ICETEST - 2015.

## MODE OF PUBLICATION & CIRCULATION OF REGISTERED PAPERS

All the accepted papers registered with the conference will be published in the conference proceedings, and also by the **Research Publishing Services** or such journals having good impact factor (subject to acceptance by the journal), will be made available in the **RPS Online** and will be indexed in **CrossRef**. In addition, they will be submitted for possible indexing in all the major indexing services like **EI, ISI Web of Science, DBLP, IET Inspec, Scopus, etc.**

## IMPORTANT DATES

Last date for submission of manuscript	: July 15 <sup>th</sup> , 2015
Notification of acceptance of manuscript	: August 15 <sup>th</sup> , 2015
Last date for submission of camera ready paper	: August 31 <sup>st</sup> , 2015
Registration for the conference	: August 31 <sup>st</sup> , 2015
Dates of conference	: 09-11 December 2015

## ABOUT TRICHUR, THE CULTURAL CAPITAL OF KERALA



Trichur, the anglicized form of the vernacular name Thrissur, is the fourth largest city in Kerala. Thrissur is also known as the Cultural Capital of Kerala due to its cultural, spiritual and religious heritage. The famous institutions of Govt. of Kerala, promoting arts, literature and culture such as Kerala Sangeetha Nataka Academy, Kerala Sahitya Academy, Kerala Lalithakala Academy and the deemed University of Kerala Kalamandalam are located in Thrissur District. The most colourful and spectacular temple festival of Kerala attracting tourists all over the world, namely Thrissur Pooram, is observed in Thrissur annually. Thrissur is well known for the large number of famous temples, churches and mosques including Guruvayoor Sri Krishna Temple, Sri Vadakkunnathan Temple, Church of Our Lady of Lourdes, Church of Our Lady of Dolours and Cheraman Juma Masjid. Being located in the central region of Kerala, Thrissur is close to many of the well known tourist attractions like Athirappally Waterfalls, Munnar, Thekkadi, Kumarakom and Kovalam. Thrissur is also the birth place of the legendary world class mathematician-astronomer Sangamagrama Madhavan of the fourteenth century, who made very notable contributions in astronomy, trigonometry, calculus, geometry and algebra apart from being the first mathematician in the world to introduce the power series expansion of the trigonometric functions of sine, cosine, arc tangent and the presently well known Madhava-Gregory-Leibnitz series.

### ABOUT KERALA STATE

The State of Kerala presents unique geographical features attracting tourists from around the globe for its scenic backwaters and lagoons, lush greenery and colourful and enchanting festivals. With the Arabian Sea on the west, the Western Ghats towering to altitudes of 500 to 2700 metres on the east, Kerala is blessed with long scenic coast lines, rivers and hill stations. It is replete with tranquil stretches of backwaters, rare wildlife, waterfalls, sprawling plantations and verdant vegetations. Kerala is also a land to Ayurvedic Resorts, historic and cultural monuments and a variety of martial art forms, all of which offer a unique experience par excellence. With cent percent literacy and world class health care systems, Kerala has the lowest infant mortality and the highest life expectancy rates among Indian States.

## ABOUT THE DEPARTMENT OF CHEMICAL ENGINEERING, GOVT. ENGG. COLLEGE TRICHUR

The department of chemical engineering set up in 1962, was the first of its kind in Kerala offering B. Tech degree through a four year course. During the B.Tech course the student is given an in depth understanding of the basic principles of engineering aided by well equipped and sophisticated equipments, by highly qualified and experienced faculty, enabling the student to groom into a professionally competent chemical engineer.

Since the Govt. Engineering College Trichur is situated very near to the industrial areas of Cochin, Palakkad and Coimbatore; there is a close rapport between the industries, Government departments or agencies and the department of Chemical Engineering. A lot of industrial research and consultancy works are carried out by the faculty members, especially in the field of industrial pollution control, safety, energy and environment, much of which earned wide acclamation and received awards and recognitions. Live industrial problems were identified and given as project works for final year B. Tech. and M. Tech. students. The department is an approved PhD centre of the University of Calicut. The core research areas of the department include water and wastewater treatment and Polymer Science and Engineering.



## ABOUT THE HOST INSTITUTION, GOVT. ENGINEERING COLLEGE TRICHUR

Govt. Engineering College Trichur has been one of the premier institutions for quality technical education in the state of Kerala, India, since its establishment in the year 1958. The second oldest Engineering College of the region, and the first established after formation of the State of Kerala, it is presently affiliated to the University of Calicut, and offers undergraduate degree programmes of B. Tech. in seven Engineering disciplines and B. Arch. in Architecture. It offers post graduate programmes of M. Tech. in ten disciplines spread under the various engineering departments and MCA programme under a separate department. Moreover, the institution is a major research centre for four branches of Engineering under the University of Calicut, and is an approved centre for research under the Quality Improvement Programme of MHRD, Govt. of India. With the funding from the TEQIP - Phase II since 2010, the institution has been able to scale up the research facilities, strengthen the post graduate and undergraduate programmes leading to improved employability of the graduates. The large number of University ranks bagged every year by the graduates from GECT is testimony to the very high academic standards maintained in the institution. The College Campus, spread over 75 acres of prime land, is located at Ramavaramapuram, 5km from Trichur town, 6km from Trichur Railway Station and around 50km from Cochin International Airport. The College has a very renowned alumni strength, many of whom are internationally and nationally acclaimed professionals, scientists, CEOs and entrepreneurs.

### REGISTRATION FEES

<b>International Delegates</b>	
From Academic/R & D Organisations	: Rs. 5,000/-
Students/Research Scholars	: Rs. 3,000/-
<b>National Delegates</b>	
From Industry	: Rs. 5,000/-
From Academic/R & D Organisations	: Rs. 3,000/-
Students/Research Scholars	: Rs. 2,000/-

### ACCOMMODATION

Accommodation shall be arranged in the nearby hotels for the interested delegates, on advance payment to the Conference Secretariat. A list of quality hotels within 5 km radius from GECT is provided in the conference web site.

### MODE OF PAYMENT

The registration fees may be remitted in the following modes

1. Demand Draft in favour of ICETEST - 2015 payable at Thrissur, India.
2. NET Banking with the relevant information furnished hereinbelow

Account Name	: ICETEST - 2015
Account Number	: 67321934020
Bank Name	: STATE BANK OF TRAVANCORE
Branch Name	: CHEROOR
Branch Code	: 7207
IFSC Code	: SBTR0000207
Swift Code	: SBTRINBBFED
MICR Code	: 680009010



### SOCIAL / CULTURAL EVENTS

A cultural programme showcasing the rich traditions and arts of Kerala will be arranged in the evening of the 2<sup>nd</sup> day of the conference, for the benefit and in honour of the delegates.



## CONFERENCE SECRETARIAT

### CHIEF PATRONS

- Mr. P. K. Abdu Rabb**  
Hon'ble Minister for Education, Govt. of Kerala.
- Dr. K. M. Abraham, I. A. S.**  
Additional Chief Secretary, Higher Education Department, Govt. of Kerala.
- Mr. B. Srinivas, I. A. S.**  
Secretary, Higher Education Department, Govt. of Kerala.

### INTERNATIONAL ADVISORY COMMITTEE

- **Dr. Narayanan M. Komerath**  
Professor, The Daniel Guggenheim School of Aerospace Engg., Georgia Institute of Technology, Atlanta, USA
- **Dr. P. A. Muhammed Basheer**  
Professor of Structural Engineering, University of Leeds, Leeds, England, UK
- **Dr. R. Sreerama Kumar**  
Chair Professor, Saudi Electricity Company's Chair for Demand Side Management & Energy Efficiency, King Abdul Aziz University, Jeddah
- **Dr. Lakshminarayanan Samavedham**  
Associate Professor, Dept. of Chemical Engg., National University of Singapore
- **Dr. A. Senthil Kumar**  
Associate Professor, Dept. of Mechanical Engg., National University of Singapore
- **Dr. Palani Balaya**  
Associate Professor, Dept. of Mechanical Engg., National University of Singapore
- **Dr. Ganesh Samudra**  
Associate Professor, Dept of Electrical and Computer Engg., National University of Singapore
- **Dr. Prahalad Vadakkaepet**  
Associate Professor, Dept of Electrical and Computer Engg., National University of Singapore
- **Dr. Rajesh Chandrasekhar Panickar**  
Associate Professor, Dept of Electrical and Computer Engg., National University of Singapore
- **Dr. Rajkasekhar Balasubramaniam**  
Professor, Dept. of Environmental Engg National University of Singapore
- **Dr. Chandramouli Viswanathan**  
Assistant Professor of Civil Engineering Purdue University Calumet

### NATIONAL ADVISORY COMMITTEE

- **Dr. Kuncheria P. Isaac**  
Vice Chancellor, Kerala Technological University
- **Dr. J. Letha**  
Vice Chancellor, Cochin University of Science and Technology
- **Dr. G. Thulasi Ramadas**  
Vice Chancellor, JNTU Kakinada
- **Dr. P. Padmavathi**  
Vice Chancellor I/C, Jawaharlal Nehru Architecture and Fine Arts University, Hyderabad
- **Dr. A. K. Nagpal**  
Emeritus Professor of Structural Engg., IIT Delhi
- **Dr. P. K. Aravindan**  
Former Professor of Structural Engg., IIT Madras
- **Dr. Devdas Menon**  
Professor of Structural Engg., IIT Madras
- **Dr. Babu J. Alappatt**  
Professor of Environmental Engg., IIT Delhi
- **Dr. T. I. Eldho**  
Professor of Hydraulics, IIT Bombay
- **Dr. K. Shanti Swaroop**  
Professor, Dept. of Electrical Engg., IIT Madras
- **Dr. Krishna Vasudevan**  
Professor, Dept. of Electrical Engg., IIT Madras
- **Dr. Deepak D' Souza**  
Professor, Dept. of Computer Science & Automation, IISc. Bangalore
- **Dr. Narasimha Prasad**  
Executive Director, Centre for Water Resources Development & Management, Kozhikode
- **Dr. V. Syam Prakash**  
Principal, Govt. College of Engg. Kannur.
- **Dr. S. Radhakrishnan**  
Principal, Govt. Engg. College Palakkad.
- **Dr. K. P. Indiradevi**  
Principal, Rajiv Gandhi Institute of Technology Kottayam.
- **Dr. B. Anil**  
Principal, Govt. Engg. College, Barton Hill, Trivandrum
- **Dr. K. Radhakrishnan**  
Chairman (Rtd.), Indian Space Research Organisation

### PATRONS

- Dr. K. Vijayakumar**  
Director of Technical Education, Govt. of Kerala
- Prof. T. Krishnakumar**  
Principal, Govt. Engineering College Trichur

## INSTITUTE ADVISORY/TECHNICAL COMMITTEE

- **Dr. M. Chidambaram**  
Professor, Dept. of Chemical Engg., IIT Madras & Chairman, Board of Governors, Govt. Engg. College Trichur
- **Dr. T. R. Sreekrishnan**  
Professor of Chemical Engg., IIT Delhi & Senior Research Advisor, Govt. Engg. College Trichur
- **Dr. Satish Vasu Kailas**  
Professor, Dept. of Mechanical Engg., IISc., Bangalore & Member, Board of Governors, Govt. Engg. College Trichur
- **Dr. A. Suresh Kumar**  
Former Principal, Govt. Engg. College, Palakkad & Mentor, TEQIP Phase II, Govt. Engg. College Trichur
- **Prof. K. S. Dinesh Kumar**  
Head, Dept. of Civil Engg., Govt. Engg. College Trichur
- **Prof. C. P. Sunilkumar**  
Head, Dept. of Mechanical Engg., Govt. Engg. College Trichur
- **Dr. B. Jayanand**  
Head, Dept. of Electrical & Electronics Engg., Govt. Engg. College Trichur
- **Dr. P. A. Solomon**  
Head, Dept. of Chemical Engg., Govt. Engg. College Trichur
- **Prof. M. Parameswaran**  
Head, Dept. of Production Engg., Govt. Engg. College Trichur
- **Prof. C. R. Muneera**  
Head, Dept. of Electronics & Communication Engg., Govt. Engg. College Trichur
- **Prof. K. J. Helen**  
Head, Dept. of Computer Science Govt. Engg. College Trichur
- **Prof. Bejene S. Kothari**  
Head, School of Architecture, Govt. Engg. College Trichur

## TECHNICAL ADVISORY COMMITTEE

- **Dr. N. Ganesan**  
Professor of Civil Engg., National Institute of Technology Calicut
- **Dr. S. Chandrakaran**  
Professor of Civil Engg., National Institute of Technology Calicut
- **Dr. K. B. Maheswaran Namboothiripad**  
Former Dean, Amrita Viswavidya Peeth, Coimbatore & Head, Dept. of Mechanical Engg., NIT Calicut
- **Dr. Elizabeth Elias**  
Professor, Dept. of Electronics & Communication, NIT Calicut
- **Dr. Abraham T. Mathew**  
Professor, Dept. of Electrical Engg., NIT Calicut
- **Dr. Mini Thomas**  
Professor, Jamia Millia Islamia, New Delhi.
- **Dr. C.V. Jawahar**  
Professor, International Institute of Information Technology Hyderabad, India
- **Dr. Dhanya C. T.**  
Assistant Professor, Dept. of Civil Engg., IIT Delhi
- **Dr. A. Unnikrishnan**  
Former Outstanding Scientist, Naval Physical & Oceanographic Laboratory, Kochi
- **Dr. Tessa Thomas**  
Project Director for Agni Missile, DRDO, Govt. of India
- **Mr. M. Chandradathan**  
Director, VSSC, Trivandrum
- **Mr. Prasad K. Panikker**  
Executive Director, BPCL, Kochi Refinery.
- **Dr. Anitha A. B.**  
Scientist F & Head, Surface Water Division, CWRDM Kozhikode
- **Mr. Rajeevan Rameth**, Associate Director, Rail Technical Authority for Structures, Middle East Rail, ATKINS, Dubai
- **Dr. C. S. Saravanan**  
Head, Computer Centre, NIT Durgapur

## ORGANISING COMMITTEE

- Organising Chairman : **Prof. Krishnakumar T.**, Principal
- Organising Secretaries (ICETEST - 2015) : **Dr. Jayanand B.**, Professor (Electrical & Electronics Engg.),  
**Dr. Vijayan P.**, Professor (Civil Engg.)
- Treasurer : **Prof. Ajay James**, Associate Professor (Computer Science)
- Co-ordinator (ICACHE - 2015) : **Dr. Manju M. S.**, Assistant Professor (Chemical Engg.)