



The 14th Innovation Competition in Construction Engineering and Management (ICCEM)

1. Background

The Innovation Competition in Construction Engineering and Management (ICCEM) is a high-level international competition, targeting graduates and undergraduates majored in civil engineering and construction management. It is sponsored by Hong Kong Gammon Construction Limited, organized by the Department of Construction Management at Tsinghua University, and undertaken by the Postgraduate Student Union and the Student Association of Science and Technology in the Department of Civil Engineering and Construction Management, Tsinghua University.

Since the first competition in 2007, ICCEM has been successfully held for twelve years. It has been becoming an international competition since 2012. A large number of students from Mainland China, Hong Kong, Taiwan, Korea, Malaysia, US, Brazil and other countries or regions have participated in this event. ICCEM covers various domains concerning construction engineering and management, such as construction technologies, construction management, laws and regulations, urban planning and management, and urban economics and real estate.

2. Objective

The purpose of ICCEM is to inspire students' innovation ability and encourage them to actively participate in innovative practices, thus educating high-level innovative talents in the construction engineering and management field. It also provides a communication platform for students worldwide to share their thoughts.

ICCEM encourages participants to solve the emerging problems in construction engineering and management using multi-disciplinary knowledge, including engineering, construction management, urban planning and management, economics and law, humanities and social sciences, computer technology and so on.

3. Organization

The organizational structure of this competition includes three committees, namely the steering committee, reviewing committee and the organizing committee.



The steering committee consists of industrial experts from Gammon and professors from universities, responsible for the determination of the topic of innovation as well as the guidance to participants on research implementation.

The reviewing committee includes the preliminary review committee, the final competition committee and the financial supervision committee, respectively responsible for the quality of competition, the fairness in assessment, the transparency in financial operations, as well as the resolution of disputes. The preliminary review committee consists of teachers from the universities participating in the competition. The final competition committee consists of well-known experts from the academia and Gammon. The financial supervision committee consists of teachers from the School of Civil Engineering of Tsinghua University.

The organizing committee includes students from the Postgraduate Student Union, and the Student Association of Science and Technology in Tsinghua University. Sub-committees will be set up in other universities, which are responsible for the promotion, communication, coordination, administration, finance and other related work of the competition. The organizing committee consists of four divisions, namely information release, coordination, competition organization, and administration. The division of information publication is in charge of competition promotion and information collection. The division of coordination is responsible for the coordination of the sub-committees as well as the organization of the preliminary evaluation. The division of competition organization is responsible for the final and the prize award ceremony. The division of administration is responsible for providing supports for other divisions.

4. Theme

With the rapid development of urbanization, the construction industry continually boosts. Nonetheless, the deterioration of ecological environment, energy crisis, the inefficiency of production, the shortage of labor force, and high incidence pose new challenges to the development of the construction industry. People-oriented and sustainable development is the future of urbanization as well as construction engineering and management.



In order to encourage students to ruminate on the above development trend, this competition calls for cutting-edge ideas and solutions to these problems. The topics cover but not limited to:

- Construction automation and robotics
- Big data and construction engineering and management
- BIM/VR/AR/MR/IOT and construction engineering and management
- 3D printing and construction engineering and management
- Safety, health and environment in construction engineering and management
- Construction safety risk management
- Green construction
- Industrialized construction
- Smart city

5. Time and Schedule

This competition will last from **March to July 2022**.

Time	Item
Before Mar.31, 2022	Registration
Before May 10, 2022	Preliminary work submission
May 11 - May 25, 2022	Preliminary evaluation
May 26 - July 5, 2022	Work improvement and re-submission
In Middle July 2022	Final competition and awards ceremony

- **Registration deadline:** 24:00, 31/3/2022.
- **Preliminary work submission deadline:** 24:00, 10/5/2022.
- **Final work submission deadline:** 17:00, 5/7/2022.

6. Prizes

Awards	Quotas	Amount (before tax)
1 st Prize	1	¥12,000
2 nd Prize	2	¥8,000
3 rd Prize	3	¥5,000



4 th Prize	6	¥2,000
5 th Prize	Other qualified teams in the Preliminary Review	¥500

Notes:

- (1) This competition follows the rule “quality comes before quantity” and prizes may not be given if there is no competent work.
- (2) Awards of more than ¥800 are subjected to taxation at the winner’s own expense.
- (3) For works with high quality (1-2 groups), we will recommend them to apply for the CIB (International Council for Research and Innovation in Building and Construction) Student Research Fund to finance their further research, or to enter Hong Kong Construction Industry Council’s Innovation Competition.
- (4) The undergraduate teams to the final will be offered with an **undergraduate excellent award** as well as an extra bonus of ¥500 each team.

7. Requirements for Participants

- (1) Each team consists of two to six members. Graduate and undergraduate students officially in a university in China or overseas are welcome to participate in this competition without restriction on the students’ majors. Teams are encouraged to collaborate with and seek support from the industry.
- (2) Each team should designate a team leader responsible for communication and coordination with the organizing committee. Each team may have up to two junior engineers from the industry as team members. The junior engineers cannot serve as a team leader.
- (3) Multi-university teams are encouraged. However, each student can only participate in one team, and each team can only submit one work.

8. Preliminary Evaluation

Preliminary works **can be presented either in Chinese or English.** When you submit your preliminary work, **a short video (3-5 minutes) which illuminates your idea and achievement is recommended.**



The first round of evaluations will be carried out by the preliminary review committee. After reviewing all works, the committee will give a rank to all works. **Based on the results, the organizing committee will select 12 groups to enter the final competition. Other qualified works win a Participation Award.**

The review process will be carried out anonymously. Reviewers will make their assessment according to the principle of fairness and impartiality. If the reviewers' scores on the same work show some substantial deviation, the organizing committee will remove the score with the maximum bias or carry on a re-evaluation.

Preliminary review results will be provided to all teams. The review of works is based on the following criteria:

(1) Innovation

- Innovative research topic
- Novel question, or the unique point of view towards a question
- Novel research method and solution

(2) Completeness

- Reliable data and data sources
- Rigorous data analysis and reasoning
- Reasonable research and analytical methods

(3) Readability

- Concise but logical expression
- Result presentation in a diverse, innovative, and creative way

Table 1 Standardized scores (for reference)

Innovation scores	100	Topics of vitally important innovation and strong practical value, using unique perspectives to analyze problems and strongly creative research methods or innovative solutions
	80	Topics of important innovation and some practical value, with its research methods or solutions of a certain creativity.
	60	Topics of some practical value, using appropriate research methods or solutions
	40	Topics that not innovative, lack of practical value, and solution can't handle the question well
Completeness scores	100	Thorough and systematic literature study, using new data, data and documentation can offer good support to research methods and the participants' view
	80	Relatively systematic literature research, data is real, proper, and can



		support the research methods and the participants' view.
	60	Conducted some literature study, has certain data to support participants' view
	40	Not enough literature study, lack of data or examples to support participants' view.
Readability scores	100	Problem-solving process is logical and concise; the results are expressed in a clear and diverse way, with concise language and format
	80	Problem-solving process is logical; the result is expressed in a clear and appropriate way
	60	Problem-solving process is rational, the result is expressed with fluent language and correct format
	40	Problem-solving process is lack of logic, and the expression is inappropriate.

The highest score is 100 points. In order to encourage participants to focus on the innovation of research topics, the total score is formed as follows:

Total score = innovation score × 40% + completeness score × 30% + readability score × 30%

9. Final Competition

The final works, presentation documents, defense, group presentation and all other related activities **must be in English.**

The final scores are calculated based on the final judges' scores, which will be based on the following three aspects:

(1) Innovation

- Innovative topic , or intelligent insights and knowledge
- Significance of a topic
- Unique point of view
- Innovative research methods and solutions

(2) Rigorousness

- Evidence of detailed data and rich literature reviews, evidence-based perspective
- Appropriate research methods
- Logical and clear research process

(3) Presentation

- Presenting the research results in a diverse way



- Presentation in a logical and concise way
- Answering questions directly and well-founded.
- Proper time management

Total score = Innovation score × 60% + Rigorousness score × 20% + Presentation score × 20%.

The organizing committee is responsible for the accommodations and meals of competitors in the final stage. **But the travel expenses are not reimbursed.** Due to the epidemic of 2019-nCoV, the combination of online and offline methods will be adopted this year, and specific measures will be notified according to the epidemic situation.

10. Research Funding

(1) In order to encourage participants to carry out innovative practice and improve the quality of works, ICCEM has established a special research funding to support the research.

(2) Each team can apply for the fund for their research by submitting a research plan. The review committee will determine whether to provide a financial support (RMB 500-2000 yuan) based on a comprehensive evaluation of the significance, innovation and feasibility of the project.

(3) Teams that have obtained the funding should carry out the research according to the research plan and timely submit their periodic reports.

11. Works and Intellectual Property

This competition does not accept works or contents that have already won an award before. Competition participants and Gammon Construction Corporation Limited shall share the ownership and intellectual property of all submitted works.

12. Registration

If you are interested in this competition, you could register your information through either of the following two ways:

- Email:



Please complete the registration form in the appendix and submit to iccem_thu@163.com before Mar. 31, 2022. To apply for research funding, please submit the application form before Mar. 31, 2022 to iccem_thu@163.com.

■ QR code:

You can scan the following QR code and complete the registration form before Mar. 31, 2022.



You will receive a confirmation notice in 24 hours after submitting your registration. Please contact the Organizing Committee for any questions or suggestions.

Contacts: Xiao Lin

Tel: 18800121867

E-mail: iccem_thu@163.com

The 14th ICCEM Organizing Committee

March 12, 2022

