University of Seoul (South Korea)

CEM Program

Professor Chang-Taek Hyun, Ph.D., P.E.
Vice President, KICEM (Korea Institute of CEM)

CONTENTS

1 Department History
2 Research
3 Teaching
4 Academic Management
5 Issues and Concerns
6 Collaboration Opportunities
7 KICEM
1. Department History

- **1975**
  - Inauguration of Architectural Engineering Department

- **1982**
  - Inauguration of the Master’s program in the Graduate School

- **1985**
  - Inauguration of the Ph.D. program in the Graduate School

- **1985**
  - Inauguration of the Masters program in the Graduate School

- **1985**
  - Inauguration of the Ph.D program in the Graduate School

- **1996**
  - The Programs in Architecture and Architectural Engineering were Reestablished as 4-year programs Within the newly formed Faculty of Architecture, Urban Planning, Landscape Architecture and College of Urban Sciences

- **1999**
  - Post-professional Graduate program Re-established as Graduate School of Urban Science

- **1999**
  - Post-professional Graduate program Re-established as Graduate School of Urban Science

- **2000**
  - Department of Architecture and Department of Architectural Engineering established

- **2002**
  - Inauguration of the 5-year Program in Architecture

- **2003**
  - Department of Architecture and Department of Architectural Engineering established as Independent programs in the Graduate School

- **2003**
  - Start to prepare ABEEK (Accreditiation Board for Engineering Education of Korea)

- **2005**
  - Reorganization into School of Architecture and Architectural Engineering

- **2009**
  - Receive the Accreditation of ABEEK

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Department: From 1975~(36 years)

CEM Program: From 1997~(14 years)
1. Department History

- **Purpose of Department**

Prepare opportunity to study overall construction process, form feasibility study to maintenance and demolition

Provide global leadership in the Architectural Engineering and urbanism of the Asian Arena

Nurture fundamental engineer based on innovative program, various practical experience, and extramural activities

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1. Department History

- **Purpose of CEM**

To produce excellent specialists who can proactively lead the 21st century’s construction environments.

- Construction environments are being rapidly changed both in Korea and abroad.

- The Laboratory of Construction Engineering and Management performs research in various fields.
1. Department History

**Faculty**

**Professor**
- Dr. Chang-Taek Hyun
  - Construction Engineering and Management
- Dr. Jung-Ho Huh
  - Building Energy and Environment, HAVC System Design and Control
- Dr. Myung-O Yoon
  - Architectural Materials & Fire Protection Engineering
- Dr. Ki-Hyuk Kwon
  - Evaluation and Analysis of Structures

**Associate Professor**
- Dr. Myoung-Jun Kim
  - Noise & Vibration Control in Buildings
- Dr. Kyo-Jin Kang
  - Construction Engineering and Management
- Prof. Jung-Min Lee
  - Job opening
- Dr. Sung-Mo Choi
  - Structures Engineering and Steel Structure
- Dr. Kang-Su Kim
  - Structures Engineering and Concrete Structure

**Assistant Professor**
- Dr. Hyung-Joon Kim
  - Structural Engineering and Building Vibration Control

**Research Professor**
- Dr. Yoo-Sang Yoon
  - Mega Project
- Dr. Hyun-Seok Moon
  - BK21

**Staff**
- Sun-Young Lee
- Jung-Min Lee

* BK21: ‘Brain Korea 21st century’ Program funded by Government
2. Research

- Research Areas (CE & M)

Dr. Chang-Taek Hyun
- Construction Eng. & Mng.
- Program Management
- Sustainability & Green Building
- Design VE & Constructability
- Contract and Claims
- Project Delivery System

Dr. Kyo-Jin Koo
- Project Financing & Project development
- Feasibility Study
- Time Management
- Information Technology

New Member (Job Opening)
- CE & M (Maintenance, LCC, LCA, etc.)

Dr. Myong-O Yoon
- Architectural Materials
- Fire Protection Engineering

New subjects related to technology changes.
2. Research

- **Research Areas (Structural Eng. & Environmental Eng.)**
  
  - **Dr. Ki-Huik Kwon**
    - Evaluation and Analysis of Structures
  
  - **Dr. Sung-Mo Choi**
    - Structural Engineering and Steel Structures
  
  - **Dr. Kang-Su Kim**
    - Structural Engineering and Concrete Structures
  
  - **Dr. Jung-Ho Huh**
    - Building Energy and Environment
    - HVAC System Design and Control
  
  - **Dr. Myung-Jun Kim**
    - Noise & Vibration Control in Buildings
    - Architectural Acoustics
  
  - **Dr. Hyung-Joon Kim**
    - Structural Engineering and Building Vibration Control

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2. Research

- **Industry Collaboration**

  ![Diagram showing collaboration between University of Seoul, CMr/PMr, A/E, Owner, Contractor/Builder, and various companies like Samsung, SKC, POSCO, LG, and more.](image)
2. Research

- On going Research 01

DEVELOPMENT OF THE INTELLIGENT
PROGRAM MANAGEMENT INFORMATION SYSTEM
(I-PGMIS) FRAMEWORK FOR MEGA-PROJECTS

http://www.mega-cm.co.kr/

Ministry of Land, Transportation & Maritime Affairs
High-Tech Urban Development Program

2. Research

- On going Research 01 : 5W2H

1. Who?
Participation of the Highest Level CEM Specialist.
- Leader : Univ. of Seoul
- Total : 34 org.

2. When?
DEC 2007 ~ Apr 2014 (6 years and 3 months)

3. Where?
Mega Projects or Multiple Projects

4. What?
The Development of Intelligent Program Management Information System

5. How?
a Practical and Theoretical Approach

6. Why?
1) 10% reduction in capital and maintenance cost
2) 20% reduction in the program duration

7. How much?
$ 10,200,000 (₩ 11 Billion)
※ 1 $ = 1,100 ₩
2. Research

On going Research 01: The Trend of Mega-Projects

- Decaying The downtown
- Change in Industrial structure
- Expansion of Cities

Mega-Projects for Urban Renaissance

2. Research

On going Research 01: i-PgMIS Concept

- Program Portal System
- Local Government
- UR Program
- MLTM
- Stakeholder's System

- Program Status
- Notice
- Legislation check
- News
- Web control Center
- Budget & Cost Situation
- Schedule & Performance Situation
- Procedure based Manual
- Visual based Program Definition
- Platform level Integration
- Documentation Mgmt. & Electronic Approval
- Cost Mgmt. System
- Schedule & Progress Mgmt.
- Performance & Maintenance Mgmt.
- Contract & Execution Mgmt.
- Process Optimizati on System
- Smart Phone System
- Cost Mgmt. System
- Program Duration Mgmt. System
- Performance Mgmt. System
2. Research

- On going Research 01 : i-PgMIS Composition

- On going Research 02

A research on estimating fatal construction cost and establishing management system

- Application on public mid and family housing and office buildings

http://www.icce.re.kr:8080/work_index.jsp

Ministry of Land, Transportation & Maritime Affairs

the Research Policy and Infrastructure Development Program
2. Research

- On going Research 02: 5W2H

1. Who?
Participation of the Highest Level Construction Cost Managers
Leader: Univ. of Seoul
- Total: 8 org.

2. When?
SEP 2006 - MAY 2011 (4 years and 8 months)

3. Where?
1) Cost Budgeting in Multifamily Housing Projects
2) Public Office Building Projects

4. What?
The Development of Fair Construction Cost Estimating System

5. How?
a Practical and Theoretical Approach

6. Why?
to Reduce Expected Accuracy Range[%]:
As Is.. -30 ~ +50 To Be.. -15 ~ +15

7. How much?
$2,000,000 (₩2 Billion)
※ 1 $ = 1,100 ₩

2. Research

- On going Research 02: The Need to Estimate Fair Cost

Differences

(ex: concrete pouring activity)

| OUTPUT (M3) | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|-------------|---|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Estimated Value | 0.49 | 2.45 | 3.25 | 3.98 | 4.63 | 5.29 | 6.07 | 7.17 | 8.47 | 9.85 | 11.29 | 12.92 | 14.8 | 16.78 | 18.75 | 20.75 | 22.79 | 24.89 | 26.01 | 27.14 |
| Observed Value | 7 | 7 | 7 | 7 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |

(Differences in labor output)

(ex: concrete pouring activity)

Labor

| OUTPUT (M3) | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|-------------|---|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Estimated Value | 0.49 | 2.45 | 3.25 | 3.98 | 4.63 | 5.29 | 6.07 | 7.17 | 8.47 | 9.85 | 11.29 | 12.92 | 14.8 | 16.78 | 18.75 | 20.75 | 22.79 | 24.89 | 26.01 | 27.14 |
| Observed Value | 7 | 7 | 7 | 7 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
2. Research

- **On going Research 02 : Definition of “Fair Construction Cost”**

  - **Total cost : Based on the design phase, include following costs**
    1. Direct cost : A cost directly attributable to the constructing product, such as material cost, direct labor cost, and estimated expenses
    2. Legal Indirect cost : indirect construction cost, administrative cost, insurance fee, surtax, etc
    3. Acceptable profit
    4. Incidental expenses : design fee, superintendent fee, CM fee, permission, etc

  - **Fair Construction Cost : 1, 2, 3 should be included**

    ※ Within Accuracy (planning ±25% / Design Development ±15% / Construction Document ±10% / Bidding ±5%)

<table>
<thead>
<tr>
<th>ANSI(94.0) &amp; AACE(1997)</th>
<th>Order of Magnitude estimate</th>
<th>Budget estimate</th>
<th>Definitive estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+50 ~ -30%</td>
<td>+30 ~ -15%</td>
<td>+15 ~ -5%</td>
</tr>
<tr>
<td>Ahuja(1988)</td>
<td>Concept</td>
<td>Preliminary</td>
<td>Detailed</td>
</tr>
<tr>
<td></td>
<td>±25%</td>
<td>±15%</td>
<td>±10%</td>
</tr>
<tr>
<td>Means(2001) &amp; contingency</td>
<td>Conceptual</td>
<td>Schematic</td>
<td>Detailed</td>
</tr>
<tr>
<td></td>
<td>20%</td>
<td>15%</td>
<td>10%</td>
</tr>
</tbody>
</table>

- **On going Research 02 : Framework for Cost prediction**

  - Case-based reasoning [CBR] is a highly effective technique in the artificial intelligence (AI) domain by solving or providing suggestions for the current problems by storing and retrieving results of previous cases.
3. Teaching

- Graduate Programs

The Department of Architectural Engineering offers one of the most diverse graduate programs in Korea, at both Master and Ph.D. level. There are presently nine research laboratories in the department.
3. Teaching

- Curriculum: Graduate (CE & M)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Construction and legal Aspects</td>
</tr>
<tr>
<td>2</td>
<td>Advanced Construction Productivity</td>
</tr>
<tr>
<td>3</td>
<td>Construction Resource Management</td>
</tr>
<tr>
<td>4</td>
<td>Construction Technology Seminar</td>
</tr>
<tr>
<td>5</td>
<td>Construction Management Seminar</td>
</tr>
<tr>
<td>6</td>
<td>Building Maintenance</td>
</tr>
<tr>
<td>7</td>
<td>Construction Safety Management</td>
</tr>
<tr>
<td>8</td>
<td>Studies in Environment Design</td>
</tr>
<tr>
<td>9</td>
<td>Advanced Construction Quality Management</td>
</tr>
<tr>
<td>10</td>
<td>Advanced Construction Cost Management</td>
</tr>
<tr>
<td>11</td>
<td>Construction Decision Making</td>
</tr>
</tbody>
</table>

4. Academic Management
4. Academic Management

- Support from the university / college

- Asian Coalition for Building Science and Construction Engineering (ACBC)
- Osaka University, The Hong Kong Polytechnic University
- Brain Korea 21 (BK21): “Development of Technology for Efficient Construction and Hazard Protection in High-rise Buildings”
- Engineering Accreditation (ABEEK)
- Student Exchange Program
- Architectural Field Trips
- and so on….

4. Academic Management

- System Support: WISE

- Campus News
- Online Submission
- Faculty Academic Planner
- Private Information
- Library
- Examination Management
- Staff
- Student Progress Reports
- Time table
4. Academic Management

**Structure**

- Architecture Aesthetics (Design)
- Architectural Engineering Function (Facilities)
- Technology (Material, Structure, Construction, management, environment)

Support from the University

Support from the College

5. Issues and Concerns
5. Issues and Concerns

◆ Program Management
◆ Delivery Systems incl. CM at Risk
◆ Sustainability & Green
◆ Global Collaboration

6. Collaboration Opportunities
6. Collaboration Opportunities

- Support from the college: ACBC, MOU

- Support from the university
# 7. KICEM
(Korea Institute Construction Engineering Management)

## About KICEM

1. Founded in 1999.

2. The leading professional membership society of construction engineering and management in Korea.

3. More than 3,000 professionals from a variety of construction business and research fields have joined KICEM.

4. Their collaborative efforts made significant contributions to the construction profession in Korea.

5. KICEM has held an annual conference as well as various seminars and workshops.

6. The Korean Journal of Construction Engineering and Management and technical reports published by KICEM are also important sources.

7. KICEM has been providing several continuing education and certification Granting programs for construction engineers.
### 7. KICEM

**Mission Statement and Goals**

KICEM promotes professional leadership in construction engineering and management, in representing the construction engineering profession, and in enhancing the capabilities of those who are involved in the application, education training, research or development of construction engineering and management.

- **To construct a systematic knowledge base on construction engineering and management.**
- **To exchange and share technical knowledge, experience, and information through education programs and cooperative activities between members.**
- **To strengthen cooperative international relationships with regard to construction.**
- **To improve the efficiency of construction engineering and management practices based on collaborative research efforts among industry, academia, and research institutes.**

### 7. KICEM

**Membership**

KICEM offers four types of membership for any individual or organization interested or involved in construction-related matters.

<table>
<thead>
<tr>
<th>Membership Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Members</td>
<td>Professional members is for the careered professionals in practice, research and education who have contributed to KICEM.</td>
</tr>
<tr>
<td>Associate Members</td>
<td>Associate members is open to any qualified person who is interested in or engaged in construction industry practice.</td>
</tr>
<tr>
<td>Student Members</td>
<td>Student membership is open to student currently enrolled in a degree-granting construction program either at a college or university.</td>
</tr>
<tr>
<td>Corporate Members</td>
<td>Companies that are engaged in construction-related services may qualify for this type of membership</td>
</tr>
</tbody>
</table>
7. KICEM (Korea Institute Construction Engineering Management)

**KICEM Activities**

**KICEM Annual Conference**
- KICEM has an annual conference, which is the only one exclusively focused on construction engineering and management area in Korea. Categories of interests in the conference are: Recent CM Projects, Management & Business in Construction, Computer & Information Technology in Construction, and Advanced Construction Management Technology.

**Korean Journal of CE & M**
- KICEM publishes the Korean Journal of Construction Engineering and Management bimonthly, which is the recognized academic journal by the Korean Research Foundation.

**Education and Training Program**
- KICEM provides education and training programs for individuals in the practice or for specific organizations, such as professional institutes and construction or engineering companies. KICEM has a great pool of instructors, including university professors and industrial experts, involved in KICEM.

7. KICEM (Korea Institute Construction Engineering Management)

**Research and Development**

“KICEM has performed many construction engineering and management related research projects and consulting works since its outset. University professors, researchers and experts from the industry have been involved in those projects.”

- Priority Analysis for Improvement of Construction Information System
- On-line Construction Project Control System through Process and Data Modeling
- Information Management Process Analysis for Construction Acquisition and Life-cycle Support (CALS)
- Intelligent Construction Work Information Gathering and Management System
- Intelligent Management System for Construction Daily Work Plans and Reports
- General Contractor’s Strategic Planning for Application of Construction Management Technology
- Work Process Modeling in Pre-construction Phase
- Improvement of Time Management System in office Building Construction
7. KICEM (Korea Institute Construction Engineering Management)

- Research and Development

- Measurement and Improvement of Efficiency in Construction Site Office
- Performance Measurement of Construction Management Delivery System
- Application of Construction Management System in Large BOT Capital Projects
- Application of Innovative Construction Schedule Management System to Construction Site
- Development of Knowledge Management System for Earth Work in Building Construction
- Modeling for Construction Progress Measurement
- Decision Process Model for Construction Finish Work
- Facility Management System for Public Arts Center
- Effective Construction Equipment Application for Productivity Improvement

http://www.jcepm.org/
7. KICEM

- JCEPM-SCOPE

The topics include:
- Construction Engineering Economics
- Construction Engineering
- Construction Practices
- Construction Management
- Computer Application in Construction
- Construction Technology
- Infrastructure Asset Management
- Facility Management
- Maintenance and Operation in Construction

- Computer-Aided Design and Engineering
- Process Simulation Models
- Information Technology
- Green Construction
- Sustainability
- Building Information Modeling
- Life Cycle Assessment and Life Cycle Environmental Analysis
- Carbon Accounting
- Cost Estimating in Green Construction

7. KICEM

- JCEPM-CALL FOR PAPERS

All the Contents should be written in English and not be over 10,000 words. Papers are needed to be prepared in full-size format on A4 size paper.

More information about paper template can be found at [www.jcepm.org](http://www.jcepm.org)

Those who are interested in our journal are welcome to submit paper a technical paper by an e-mail to [jcepm@kicem.or.kr](mailto:jcepm@kicem.or.kr)

The submission due date for the first publication is 2011/02/28. The journal will be published quarterly so papers can be submitted continuously even after above date.
Volunteering
Exercising
Site trip
Membership
Workshop
Bazaar

Q & A

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http://cemuos.uos.ac.kr/korean/portal.php