Mechanical Engineering

Education Accreditation In China

Chinese Mechanical Engineering Society
China Engineering Education Accreditation Association
Mechanical Accreditation Sub-Committee

Pro. CHEN Guanlong
A. Reform Situation of Engineering Education in China

B. Mechanical Engineering Education Accreditation in China

C. International Exchanges and Cooperation
A. Reform Situation of Engineering Education in China

B. Mechanical Engineering Education Accreditation in China

C. International Exchanges and Cooperation
Chinese Engineering Education is on a large scale

- 90% universities have engineering program in China
- 1/3 of the universities program are engineering program
- 30% students major in engineering
Importance of Engineering in Higher Education

- There are 1047 universities established engineering majors, accounting for about 91.5%.

- 1/3 of the undergraduate students major in engineering.

- Guidance and demonstration for improving and reforming talent cultivation.
Quote Lu Yongxiang’s speech on the 2009 International Conference of Eng. Education

* Lu Yongxiang, the former president of the Chinese Academy of Sciences & honorary president of CMES

- Explore global engineering education which can meet the future demands, impulse scientific and technological progress, also promote the development of human civilization.
The Capabilities Required as a Future Engineer

- Professional knowledge & skills
- Capability to deal with interdisciplinary studies
- Humanities and comprehensive ability
- Innovation
- Leadership
- Lifelong learning
- Communication and teamwork
- Ability to adapt to a multi-cultural environment
Purpose of Chinese Engineering Education Accreditation (CEEA)

- Improve the accreditation criteria and the accreditation organization of engineering education program
- Reach the international mutual recognition of Chinese Bachelor degree in engineering and engineer’s qualification
- Strengthen engineering students' comprehensive abilities
- Promote China to join the Washington Accord
Recent Progress of CEEA

- Established the organization of engineering education accreditation
- Formulated the equivalent accreditation criteria
- Selected and trained a professional accreditation group
- Accredited 266 programs covered different professional fields
- China became a provisional member of Washington Accord at 2013 International Engineering Alliance Conf. @ Seoul

Thank you for your support to China!
Organization Structure of CEEAA

Member Profession Association

Member Society

Member Union

Supervisory Board

Sub-Committee

Sub-Committee

Secretariat

Sub-Committee

Review Committee

Academic Committee

Secretariat

Council representatives from CEEAA, public

………

………

………
Caption for the Organization Structure

- CEEAA council – Conduct the accreditation and lead 14 sub-committees of professional certification
- Review Committee – Review the accreditation conclusion
- Academic Committee – Academic work
- Secretariat – Routine work
## Accreditation Progress Overview

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</table>
A. Reform Situation of Engineering Education in China

B. Mechanical Engineering Education Accreditation in China

C. International Exchanges and Cooperation
Scope of Chinese Mechanical Engineering in Higher Education

- 79 out of the 112 Key universities have mechanical engineering major, accounting for 71%

- 1559 mechanical majors nationwide
Core Concepts of Accreditation – Student Centered

- Target: Cultivating students
- Content: Designed based on students’ expectation
- Principle of judgment: Favorable for students to achieve desired goals
- Focus: Evaluation of students performance
- Scope: Covering all students
Core Concepts of Accreditation – Ability Oriented

- Emphasize on constructing practical teaching system and developing students’ practical ability

- Universities need to refer to employers when establishing talents’ developing plan and curriculum

- Faculty are required to have practical engineering experience
Core Concepts of Accreditation – Continuous Improvement

- The establishment of the teaching management system aimed at continuous improvement
- Regularly assessment and evaluation are the basis of improvement
- The realization of continuous improving relies on effective quality control and feedback system
- Each faculty shoulders the responsibility
Progress

The number of accredited majors grew steadily since 2006
Mechanical Engineering Education Accreditation

Mechanical Accreditation Sub-Committee

Secretariat

Evaluators

Document

- Number 67
- 47% From industry

Formulate the complementary accreditation criteria and relevant working documents
■ Documentation (2013 version)

- The Policy and Procedure of Engineering Educational Programs Accreditation
- The Engineering Educational Programs Accreditation Criteria --- General Criteria & Complementary Program Criteria
- Management of Engineering Educational Programs Accreditation Evaluators
- Guidance for Universities’ Preparation for Accreditation
- Guidance for the Program Evaluators
Promotion and Improvement

1. Improve students’ practical ability

- Teachers’ imparting converts to students’ active learning
- Theoretical study converts to engineering practice
- Individual learning converts to team work
Example: HUST Curriculum Reform

- Mechanical Design and Manufacture Training Projects
Promotion and Improvement

2. Broaden students’ vision

- Increasing practical teaching and information communication, promote international cooperation
- Students international exchange
- Strengthening the cooperation between school and industry, and promoting students' engineering practice ability
Example: SJTU International Degree Program

- **Combined B.S. & M.S.**
  - 3 Years in SJTU
  - 1 Year exchange Abroad
  - 1 Year M.S Abroad
  - SJTU B.S.
  - M.S.

- **Dual B.S.**
  - 2 Years in SJTU
  - 2 Year Abroad
  - SJTU B.S.
  - ? B.S.

- **CLFM**
  - 2.5 years full time Professional Training
  - MIT Courses + SJTU Courses
  - SJTU MBA
  - SJTU M.E.
Train Students:

- How to define problems and tasks
- How to arrange the procedure
- How to launch a project
- How to execute a project
- How to communicate with people of different background
- How to cooperate
- .........
Example: Train Students

- Foreign Students cooperate to complete practical project
Promotion and Improvement

3. Improve the international engineering teaching ability

- Numerous universities established international cooperative platform
- Encouraging faculty to attend international conferences
- Promoting teachers’ engineering background
- Spurring teachers to focus on cultivating abilities instead of imparting knowledge
Example: SJTU Global Partnership Network
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### Invited experts abroad to observe the accreditation process

<table>
<thead>
<tr>
<th>University</th>
<th>Accreditation experts invited</th>
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<tr>
<td>Zhejiang Univ.</td>
<td>Hong Kong Institution of Engineers; IMechE</td>
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<td>Harbin Institute of Technology</td>
<td>Mechanical Engineering and Automation</td>
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<td>Xi’an Jiao Tong Univ.</td>
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<tr>
<td>Hunan Univ.</td>
<td>ASME</td>
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<tr>
<td>Southeast Univ.</td>
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</table>
International Exchanges and Cooperation

- **International Conferences**

  - **2012 International Mechanical Engineering Summit**
  - **2011 International Leadership Summit on Mechanical/Multi-Disciplinary Engineering Education**
  - **2013 Cross-strait Engineering Education Round Table**

  - **USA**
  - **Cross-strait**

  - **UK, USA, Korea, Japan**
International Exchanges and Cooperation

Topic:

- 2011 International Leadership Summit on Mechanical/ Multi-Disciplinary Engineering Education

  International Exchange

- 2012 International Mechanical Engineering Summit

  Focus On Student Ability

- 2013 Cross-Strait Engineering Education Round Table

  Based on criteria, construct featured universities, respect student’s personality
Thank you for supporting and assisting Chinese engineering education career!

With the support of you, China aims to be the formal member of WA in Istanbul 2015.
Thank you!