Experience Sharing from IEET

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IEET Secretary General & CEO
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President, Taiwan Construction Research Institute
Founding President, Taiwan Society for Circular Economy

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IEET Deputy Executive Director

28 December 2019
Council of Engineers Thailand
TABEE
Outlines

About IEET
- Higher Education in Taiwan
- Organizational structure
- Accreditation Development

Accreditation System and Process
- Evaluator Development
- Readiness Review
- Decision Meeting

Accreditation Criteria
- Program Educational Objective
- Course Assessment
- Program Evaluation

Sharing Experience
- Evaluation Template SSR
COET has made request to the IEA Secretariat for IEET to be its Mentor.
IEET, Founded in 2003

Each commission operates independently and members are from the specific discipline.
Education System in Taiwan

- Elementary School (6 yrs.)
- Junior High School (3 yrs.)
- Senior High School (3 yrs.)
- Comprehensive U & U. of Science & Technology (4 - 5 yrs.)
- Technical College (4 yrs.)
- Senior Vocational School (3 yrs.)
- Junior College (2 yrs.)
- Working Experience
- Doctoral degree (~3 yrs. or more)
- Master’s degree (2 yrs.)

12 years pre-university education
Higher Education Institutions in Taiwan
N=153

<table>
<thead>
<tr>
<th>Year</th>
<th>Univ.</th>
<th>Univ. of S&amp;T</th>
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</table>

Note: Date source is from M.O.E., Taiwan (by autumn semester).
Military, police, religious, and continuing education institutions are excluded.
IEET was approved by the Washington Accord and the Sydney Accord in 2018 for another 6 years period as signatory.

Became WA Signatory In 2007

Became SA Signatory In 2014
Development of the Washington Accord
as of June 2019

1989: Original 6
1990s: +2
2000s: +5
2010s: +7
Provisional Status
Washington Accord and Sydney Accord Issue Accreditation Marks for Accredited Programs (by the current signatories) to Use
IEET Accredited Logos

EAC  CAC  TAC  AAC  DAC
IEET Accreditation Certificate (Sample)
Universities Participated in IEET Accreditation (N=85)

- Private University: 24 (28.2%)
- Public University: 23 (27.1%)
- Public University of S&T: 7 (8.2%)
- Private University of S&T: 26 (30.6%)
- Military and Police Academy: 3 (3.5%)
- Institute: 2 (2.4%)
Well-Experienced Accreditation Agency
Programs Participated in IEET Accreditation 2004-2018 (N=1,515)
Annual operation is about 150 programs in 50 Universities

- EAC: 1,161 (76.6%)
- TAC: 126 (8.3%)
- GTAC: 56 (3.7%)
- CAC: 92 (6.1%)
- AAC: 26 (1.7%)
- DAC: 54 (3.6%)
IEET CQI Mechanisms

- Signatories
- Periodic Reviews

- Bi-weekly with CEO
- Monthly with President/AC Chair

- Feedbacks from univ./programs

International Accord

Universities & Program

Internal System

Committees

- Accreditation teams
- All committees

IEET CQI Mechanisms

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OED
Weekly Debrief and Reflection during Visit Season

It’s now Online!
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IEET Accreditation is of 6-year Accreditation Cycle

Between 3rd & 4th year a possible Interim Review

Every 6 years a General Review
# Types of Review

<table>
<thead>
<tr>
<th>General Review</th>
<th>Interim Review</th>
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</thead>
<tbody>
<tr>
<td><strong>Time</strong></td>
<td><strong>Time</strong></td>
</tr>
<tr>
<td>• Every 6 Years</td>
<td>• Usually between 3(^{rd}) and 4(^{th}) Year within a cycle</td>
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<tr>
<td><strong>Document Review</strong></td>
<td><strong>Document Review</strong></td>
</tr>
<tr>
<td>• Self-study Report with 6 years of data</td>
<td>• Focused report on improvement from last general review</td>
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<tr>
<td>• Related documents</td>
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<tr>
<td><strong>On-site Visit</strong></td>
<td><strong>On-site Visit</strong></td>
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<tr>
<td>• 2 days visit</td>
<td>• 1 day visit</td>
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</table>
Make Up of Accreditation Team (Peer Review)

For each program, 3-member Team.
Nomination of Accreditation Teams

- Recommended by Commission, Industry, or Academic Societies
- Nominated by Commission Chair with Approval by Accreditation Council Chair
- Participate in IEET Training Workshops
- Assigned to Teams
Nomination of Conveners and Chairs

<table>
<thead>
<tr>
<th>Conveners</th>
<th>Chairs</th>
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<tbody>
<tr>
<td>• Former university presidents</td>
<td>• Senior program evaluators</td>
</tr>
<tr>
<td>• Senior deans</td>
<td>• Academics with administrative experience</td>
</tr>
</tbody>
</table>
Training of Accreditation Teams

**New Program Evaluator**
- One-day Workshop
- Observer in Review Team

**Current Program Evaluator**
- Refresher Training
- International Observation

**Team Chair/Team Convener**
- Refresher Training
- Annual Chairs and Conveners Meetings
- International Observation
Responsibility of Program Evaluator

- Conduct each visit and interview according to the Accreditation Criteria
- Participate on-site visit in its entirety according to the on-site visit itinerary
- Evaluate all supporting documents provided by the program under review
- The Exit Statement shall reflect the Program’s actual merits and areas for improvement; it shall be provided in written form, using language that is fair, reasonable, clear, succinct, and non-emotional, while complying with the IEET format.
- Abide scrupulously by the requirements of the Code of Ethics
- Compile the Exit Statement
Principles of Conflict of Interest

1. Having, in the past three years, held or is currently holding a full-time or part-time position in the program;
2. Having awarded the highest academic degree by the program;
3. Having awarded an honorary degree by the university that the program belongs to;
4. Having spouse or relative up to twice removed work or enroll in the program;
5. Holding a paid position, as member of an advisory committee member or a board member, etc. in the university that the program belongs to;
6. Serving as a member of the program's advisory or self-study committee during the same academic year when the accreditation occurs;
7. Having any other stake-holding affiliations with the Program that is capable of undermining accreditation objectivity
Code of Ethics

Confidentiality

» Keep evaluators’ identities confidential prior to the review

» Keep all accreditation documents confidential
  1. Documents from the program
  2. Documents drafted by the accreditation teams
  3. All meetings and discussions
  4. Discussions in the decision meetings

Please consult IEET’s *Code of Ethics for Accreditation of Programs*
Prior to Visit… IEET Team has done reviewing:

- Self-study Report
- Transcript Analysis
- Visit itinerary & list of interviewees
- Meeting minutes or abstracts
During Visit… IEET Team is to review:

- Course Portfolio
- Transcript analysis
- Samples of student works
In order to help PEVs refreshing their knowledge about essence of accreditation, IEET developed a testing scheme of 10 questions for the program evaluators to refresh their memories in 2019.
## Checklist of Evidence to be Observed

<table>
<thead>
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<th>2019年IEET實地訪評認證團檢視清單</th>
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<tbody>
<tr>
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After Visit… IEET Team will be reviewing:

- Reply from the program
- Final statement
- Any other evidence
Accreditation Reports

- Exit Statement (announced at exit)
- Accreditation Statement Draft (taking into account of the program’s reply)
- Accreditation Statement
- Accreditation Action Report

Note: All reports are written by the accreditation teams.

2019 IEET Guideline for Drafting Accreditation Statement

Statement:
1. The number of statements, including strength and area for improvement, for each criterion should not go beyond the criteria.
2. Statement should not express nor imply any cross-institutional or cross-program comparison or have direct wording on student-teaching staff ratio or related wording.
3. Strength should be statement that are of uniqueness of the program. No statement is needed if a program is simply in compliance of a criterion.
4. Area for improvement should be statement of incompliance of the criterion. Accreditation teams are recommended to write the statement with specific attention to: “what does the criterion require?”, “Did documents provided by the program prove compliance?”, and “what are the possible impact due to incompliance of the criterion?”
5. Findings of substantiality should be reflected in the statement and not just expressed verbally to a program or placed in the observation section.
6. Other comments not related to the criteria should be placed in the observation section with no more than two statements in principle.
7. Statement must be checked and modified if appropriate after receiving a program’s Response to Exit Statement. Adding new statement, especially in area for improvement, is not recommended for the program would not have opportunity to reply.

Level of Criteria Compliance and Accreditation Action:
1. Level of criterion compliance should be consistent with the strength and area for improvement. If the compliance level for a criterion is either “Concern”, “Weakness” or “Deficiency”, statements must be clear and precise. If the comments are simply minor suggestions, “Observation” should be given to that criterion.
2. In accordance with OBE, criterion 1, 3, 4, and 9 are the most important criteria.
   2.1 If criterion 4 failed to receive “Observation”, criterion 3 should not be “Observation”.
   2.2 If criterion 3 and 4 failed to receive “Observation” due to the insufficiency of improvement, criterion 9 should not be “Observation”.
   2.3 Criterion 9 is Continuous Improvement. If a program exhibits appropriate system of continuous improvement in place with progress, it is considered as in compliance with the criterion.
   2.4 Due to lack of time to implement continuous improvement system, criterion 1, 3, 4, and 9 are recommended not to be given “Observation” to program entering accreditation for the first-time in order to monitor the program’s system and progress of continuous improvement.
3. If most of the programs within a department are entering the second accreditation cycle while a new program is introduced, the new program must have an Interim Review with Visit as well.
4. For program entering second accreditation cycle and if most criteria received “Observation” (including criterion 3, 4, and 9) and few criteria have “Concern”. Next General Review should be recommended. If the self-study report and relevant documents are not sufficient in providing proof of compliance of criteria but the program is able to prove compliance during the on-site visit, a one-year accreditation action is recommended.
5. If a second or beyond cycle program under Interim Review shows lack of evidence of continuous improvement in criterion 1, 3, 4, and 9, a “Not to Accredit” action could be recommended.
6. The accreditation teams are highly recommended to pay special attention to any criterion that are of “Weakness”. In case where the program lacks evidence in continuous improvement, the statement and accreditation action should reflect appropriately, such as recommending a less than 3-year accreditation period for the accreditation action.
Six-Level of Consistency Checks

- **AC** - Ratify
  - **EAC** - Decision Meeting
    - **EAC Editor** - Consistency among programs in same discipline
    - **OED** - Consistency in wording and phrase
    - **Team Convener** - Consistency among teams
    - **Team** - Consistency among team members
Decision Meeting Follows
Transparent and Objective Procedures

Welcome & Introduction
Confirmation of Meeting Procedures
Nomination of Scrutinizer

Vote Count
Consent Case Discussion and Voting
Non-consent Case Chair Presentation, Floor Discussion and Vote

Confirmation of Actions
Closing
Decision Meeting Procedures

Institute of Engineering Education Taiwan
Engineering Accreditation Commission

2018 Accreditation Decision Meeting Agenda
January 29 (Tuesday), 9:30 am to 4:00 pm, meeting reporting time: 9:00 am
Room 509, General Building, Taiwan Normal University
No. 1, 129, Sec. 1, Heping E. Rd., Da’an Dist., Taipei

Agenda
1. Welcome and Introduction- Meeting Chair (Commission Chair)
   1.1 Opening remarks by chair
   1.2 Roll calls
2. Meeting Procedures Overview- Executive Director
   2.1 Confirmation of the conflict of interest and confidentiality clauses
   2.2 Review of IEET six levels of consistency checks
   2.3 Review of guidelines for drafting accreditation statement
   2.4 Decision meeting documents
      2.4.1 On-site meeting materials
      2.4.2 Overview of accreditation decision list
2.5 Review of Voting Provisions
2.6 Review of Voting Procedures
   2.6.1 Team chair reporting
      2.6.1.1 Level of compliance by criterion
      2.6.1.2 Status of continuous improvement
      2.6.1.3 Accreditation action recommendation
   2.6.2 Comments from the team convener, editor, executive director
   2.6.3 Discussion and motion
   2.6.4 Vote on motion
   2.7 Confirmation of above procedures
3. Nomination and Confirmation of Vote Tallymen- Meeting Chair
4. Decision Making Begins- Meeting Chair
   4.1 Non-consent cases
   4.2 Consent cases
5. Announcement of Voting Outcomes- Meeting Chair
   5.1 Vote counts
   5.2 Confirmation of the actions
6. Adjourn- Meeting Chair
   6.1 Concluding remarks by Chair
   6.2 Adjourn
1. Case Grouping:

   (1) Non-consent case: Programs falling under one of the followings:
       1. General review.
       2. Subsequent review after provisional status.
       3. Subsequent review after receiving action pending in the last review.
       4. Interim review with inconsistent recommendations between visit team and editor on one of the followings:
          1) Years to be accredited.
          2) Level of compliance on two or more criteria.
          3) None of the above but the case has editorial comments in the accreditation statement and was suggested to be a non-consent case by editor.
       5. Interim review with a non-NGR recommendation and the accredited length is shorter than the previous review.
       6. Any consent case that is motioned by the assembly to be non-consent case.

   (2) Consent case: Interim review programs that the visit team and editor are in consensus on one of the followings:
       1. Years to be accredited and level of compliance of all criteria.
       2. Years to be accredited and level of compliance of all but one criterion.

2. Voting:

   (1) Voting right: Commissioners, visit conveners, and visit team chairs all have one vote per case; those who have duel positions, their individual vote still count as one valid vote. Those who have conflict of interest with a subject case must be excused when the case is being discussed and voted.

   (2) Vote casting:
       1. Non-consent cases: One vote per case. Program name and its related information on level of compliance and accreditation action on will be displayed one at the time.
       2. Consent cases: List of all program names and their related information on level of compliance and accreditation actions will be displayed on a single webpage and be voted on at the same time.

3. Ballot Types and Counting:

   (1) Conflict of interest ballot: Ballot that is invalid due to conflict of interest. Office of the Executive Director will exclude these ballots before the decision meeting.

   (2) Count of ballots to be collected: Sum of total ballots (from total of voting attendees) minus conflict of interest ballots.

   (3) Void ballot: Ballot that was not casted due to the voter was absent from casting or refused to cast.

   (4) Count of valid ballots: Sum of total ballots from affirmation, negative and void ballots. To be the same as count of ballots to be collected.

4. Vote Calling:

   (1) The meeting chair will appoint a tallyman.

   (2) A motion is carried with a simple majority.

   (3) In case where a motion is lost, it needs to be debated and voted again. Second debate is limited to once per a case.

   (4) The chair and the tallyman will double check the vote inventory and racking report and sign them.

   (5) The chair will announce the result of the votes.
Categories of Accreditation Action

Level of Compliance w/ Criteria
- Observation
- Concern
- Weakness
- Deficiency

Accreditation Teams make holistic judgement on level of compliance for each criterion and accreditation decision.

Accredited
- Next General Review (6 years)
- Interim Review (3 years)
- Provisionally Accredited

Accreditation Pending

Not to Accredit
Appeal Policy is in Place

Program denied for accreditation

Errors in fact or errors in procedures

Submit appeal

AAC re-nominate review team

Appeal stands

Appeal Committee reviews

Program is reviewed again

Decision meeting

41
IEET eSystem

Accreditation Management System

for PEVs

Allows Accreditation Teams:
1. Read documents anytime anywhere
2. Write statement anytime anywhere
3. Integrate comments from all evaluators in a team
4. Streamline the consistency discussion
Accreditation Management System

http://ams.ieet.org.tw

Functions of AMS

- Evaluators can access program information at anytime and from anywhere using the internet.
- Accreditation statements can be edited and be combined into Exist Statement online.
- Simplify consistency check process through easy access of the accreditation statements.
- Provide latest training for evaluators at anytime and from anywhere.
- Elimination of waste and save time by being paperless.
- Gathering of Big Data on related accreditation information.
You can access the evaluators training materials and the Evaluator Manual at “Training”.
You can access “Administration” to complete information on transportation, dietary requirements, additional supplements from program, and conflict of interest checklist. You can also access information on accreditation team, hotel, and pre-departure notice.
After reviewing documents from program, you can start to write accreditation statements. Click “Accreditation Statement” to start. For more information, please review the AMS user’s manual.
You can click “Program Document” to access all documents from the program, including SSR, attachments, and previous IEET statements (if any).
You can click “IEET Manual” for the latest Accreditation Manual.
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Evaluation Template SSR
ABET Promotes OBE since 2000 with EC2000 Criteria
Outcomes-based Education (OBE)

- University/College Missions
- Knowledge Skills Attitudes
- Graduate Attributes (GA)
- Curriculum & Instruction
- Faculty Assessment of Student Work
- Continuous Improvement
- Review and Reflection on Assessment
- Program Educational Objectives (PEO)
- Advisory Committee
“Outcome-based education (OBE) means clearly focusing and organizing everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences. This means starting with a clear picture of what is important for all students to be able to do, then organizing curriculum (outcome), instruction (activity), and assessment to make sure this learning ultimately happens.”

Outcomes Based Education: Critical Issues
by William Spady
(1995)
What are Student Outcomes?

**Input**
- Number of Faculty
- Volume of Resources
- ...

**Output**
- Number of Graduates
- Number of Papers
- ...

**Outcomes**
- Graduate Attributes
- Program Educational Objectives
- ...

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Problems that we face are more complex. Boundaries are blurring. Technology changes very fast.

Why OBE?

Jigsaw curriculum is no longer sufficient.

Contemporary education must allow students to “learning by doing”
Problem/Project-based Learning (PBL)

Outcomes/Competency-based Education (OBE)

Medicine Engineering Business Moving to OBE

Learning by Doing
Engineering Design

THE ENGINEERING DESIGN PROCESS

- Define the problem
- Identify constraints on your solution (e.g., time, money, materials) and criteria for success
- Brainstorm multiple solutions for the problem
- Select the most promising solution
- Prototype your solution
- Test and evaluate your prototype
- Iterate to improve your prototype
- Communicate your solution

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IEET Requires Capstone
Capstone Course is the Last Mile

Capstone only for Bachelor’s Degree Program

Freshman & Sophomore
- Mathematics courses
- Science courses
- Analysis courses
- Basic design courses

Junior & Senior
- Other required courses
- Other electives
- Capstone
Key of Capstone Course is Teamwork, Hands-on, Integration

Teamwork
Not a single student project
Hands-on
Less lecturing, more advising
Integration
More on integration than learning new things
Capstone Provides Culminating Experience

**Teamwork**  **Hands on**  **Integration**

- **Integrate Graduate Attributes**
- **Realize what GA are lacking**
- **Strengthen those GA that are needing**
- **Self-Assessment**

Try to solve an engineering problem
Use Capstone to Assess GA

Lecture
To assess knowledge

Hands-on Course
To assess skills
To assess attitudes

Capstone
To assess knowledge
To assess skills
To assess attitudes

Competency in Engineering Design
OBE, How...

Set up PEO and GA

Professor’s expectation?
Professor’s reasons for teaching?

Teach what?
How to teach?

What student learn?
How professor know?

Assessment of PEO and GA

Continuous Improvement of Curriculum & Teaching

Curriculum/Course activities Cultivating GA
Ability in Engineering Design = Student Outcomes

Knowledge allows students to know how to think and to design.

Skills allow students to learn through experiencing and hands-on.

Attitudes allow students to learn to work with others, self-recognition and confidence.
Graduate Attributes vs Program Educational Objectives

Graduate Attributes (at time of graduation)
- Knowledge
- Skills
- Attitudes

Program Educational Objectives (Achievement 3~5 years after graduation)
- Professionals who are able to architectural design, contribute to the betterment of the society
- Professionals who are capable of life-long learning
Students

Assessment of the classes (Cultivating GA)

Graduates

Assessment of the GA

Alumni

Assessment of the PEO

Possess entry-level professional competency
PEO and GA Assessment Point

Freshman
Sophomore
Junior
Senior

3 Year after Graduation
2 Year after Graduation
1 Year after Graduation
Time for Graduation

4 Year after Graduation
5 Year after Graduation
... Year after Graduation

PEO

GA
Differentiate Assessment of PEOs and GAs

Graduate Attributes:
Knowledge, Skills, Attitudes at time of graduation

Program Educational Objectives:
Achievement 3~5 years after graduation
Including the professional competencies

Capstone Course Assessment (Direct)
Graduate Survey (Indirect)
Employer Survey (Direct)
Alumni Survey (Indirect)
Each Program Must have an Advisory Board

**WHO**
About 10 people:
- Industry
- Alumni
- Academia
- …

**WHAT**
1. Help to set:
   - PEO, GA, and curriculum
2. Review on an annual basis:
   - Student outcomes, capstone course outcomes, faculty feedbacks, etc.

**WHEN**
At least Once a Year

**No:**
Administrator or academia from its own university
Structure of IEET Accreditation Manual

Accreditation Criteria

Policies and Procedures

Templates for Self-study Report
Documents Relating to Criteria

Accreditation Criteria for Accrediting Engineering Programs

Accreditation requirements in very concise language.

A guide with detailed information on evidences to be presented in the self-study report and the onsite visit.

Both are public information for programs under review as well as IEET accreditation teams to ensure transparency.
Nine Elements of Accreditation Criteria

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Program Educational Objectives</strong></td>
<td></td>
</tr>
<tr>
<td><strong>2. Students</strong></td>
<td></td>
</tr>
<tr>
<td><strong>3. Graduate Attributes</strong></td>
<td></td>
</tr>
<tr>
<td><strong>4. Curriculum</strong></td>
<td></td>
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<tr>
<td><strong>5. Faculty</strong></td>
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<tr>
<td><strong>6. Space and Facility</strong></td>
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</tr>
<tr>
<td><strong>7. Funding and Support</strong></td>
<td></td>
</tr>
<tr>
<td><strong>8. Program Criteria</strong></td>
<td></td>
</tr>
<tr>
<td><strong>9. Continuous Improvement</strong></td>
<td></td>
</tr>
</tbody>
</table>
Criterion 1

Program Educational Objectives (PEO)

1.1 publish detailed PEOs that demonstrate the program’s characteristics and relevance to the contemporary trends and societal demands;
1.2 describe the relationship between the PEOs of the program and those of institution, as well as the process of establishing these objectives;
1.3 describe the manner in which the design of the curriculum are consistent with the PEOs;
1.4 institutionalize an effective assessment process to assure the achievement of the PEOs.
Program Setting Up PEO and GA

Program drafts PEOs and GAs

Advisory Committee reviews and comments

Program finalizes PEOs and GAs

Program communicate PEOs and GAs to students, parents, society at large

Program revises PEOs and GAs on a regular basis based on alumni and industry feedbacks
PEO (Example)

Program A.

1. Possess basic professional knowledge and skills.
2. Possess basic communication and implementation skills for practice.
3. Possess basic research skills.
4. Possess humanities and skills of service for the society.

Program B.

1. Possess professional knowledge and technology application abilities.
2. Possess teamwork.
3. Possess international scope of view.
PEO (Example)

Program C.
Cultivating professional knowledge and its application, research abilities, leadership, professional ethics in the engineering fields to be leaders in the technology innovation, environmental protection and sustainability.

Program D.
Cultivating humanities and scientific spirit, balanced knowledge in theories and practice, able learners in independent thinking, innovating knowledge and international scope of view.

What’s the problem with this kind of description?
Hard to do assessment
### Relationship between Curriculum and PEO

#### Relationship between Course and GA

<table>
<thead>
<tr>
<th>Course</th>
<th>GA 1</th>
<th>GA...</th>
<th>GA 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course 1</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course 2</td>
<td>V</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course 3</td>
<td>V</td>
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<td>Course 4</td>
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</tr>
<tr>
<td>...</td>
<td>V</td>
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<td></td>
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</tbody>
</table>

#### Relationship between GA and PEO

<table>
<thead>
<tr>
<th>GA</th>
<th>PEO 1</th>
<th>PEO...</th>
<th>PEO 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA 1</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GA 2</td>
<td>V</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>GA 3</td>
<td></td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>V</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>...</td>
<td>V</td>
<td></td>
<td>V</td>
</tr>
</tbody>
</table>

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## Alumni Survey

<table>
<thead>
<tr>
<th></th>
<th>5 Very Important</th>
<th>4 Important</th>
<th>3 Neutral</th>
<th>2 Less Important</th>
<th>1 Not At All Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Exhibit professional competency of a civil engineer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Exhibit capacity for independent practice and team work to solve increasingly complex engineering problem</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Exhibit capacity for lifetime learning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 Highly Agree</td>
<td>4 Agree</td>
<td>3 Neutral</td>
<td>2 Disagree</td>
<td>1 Highly Disagree</td>
</tr>
<tr>
<td>1. Exhibit professional competency of a civil engineer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Exhibit capacity for independent practice and team work to solve increasingly complex engineering problem</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Exhibit capacity for lifetime learning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ask about Importance of PEOs**

**Ask about Fulfillment of PEOs**
# Employer Survey

<table>
<thead>
<tr>
<th>1. Exhibit professional competency of a civil engineer</th>
<th>5 Very Important</th>
<th>4 Important</th>
<th>3 Neutral</th>
<th>2 Less Important</th>
<th>1 Not At All Important</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>2. Exhibit capacity for independent practice and team work to solve increasingly complex engineering problem</th>
<th>Ask about Importance of PEOs</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>3. Exhibit capacity for life-time learning</th>
<th>5 Highly Agree</th>
<th>4 Agree</th>
<th>3 Neutral</th>
<th>2 Disagree</th>
<th>1 Highly Disagree</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>1. Exhibit professional competency of a civil engineer</th>
<th>Ask about Fulfillment of PEOs</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>2. Exhibit capacity for independent practice and team work to solve increasingly complex engineering problem</th>
<th>1. Exhibit professional competency of a civil engineer</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>3. Exhibit capacity for life-time learning</th>
<th>2. Exhibit capacity for independent practice and team work to solve increasingly complex engineering problem</th>
</tr>
</thead>
</table>

© Institute of Engineering Education Taiwan
<table>
<thead>
<tr>
<th>Criterion 3</th>
<th>Graduate Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ability to apply knowledge of mathematics, science, and engineering;</td>
</tr>
<tr>
<td>2.</td>
<td>ability to design and conduct experiments, as well as to analyze and interpret data;</td>
</tr>
<tr>
<td>3.</td>
<td>ability to apply techniques, skills, and modern tools necessary for engineering practice;</td>
</tr>
<tr>
<td>4.</td>
<td>ability to design an engineering system, component, or process;</td>
</tr>
<tr>
<td>5.</td>
<td>ability to manage project (including budgeting), communicate effectively, work in multi-disciplinary environment, and function on teams;</td>
</tr>
<tr>
<td>6.</td>
<td>ability to identify, formulate, research literature and analyze complex engineering problems reaching substantial conclusions;</td>
</tr>
<tr>
<td>7.</td>
<td>knowledge of contemporary issues; an understanding of the impact of engineering solutions in an environmental, societal, and global context; and the ability and habit to engage in life-long learning;</td>
</tr>
<tr>
<td>8.</td>
<td>apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice, and a sense of respect for diversity.</td>
</tr>
</tbody>
</table>
Program’s GA Must Cover all IEET’s

<table>
<thead>
<tr>
<th>Program’s GA</th>
<th>IEET Criterion 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.1</td>
</tr>
<tr>
<td>GA 1</td>
<td>1</td>
</tr>
<tr>
<td>GA 2</td>
<td>0</td>
</tr>
<tr>
<td>GA 3</td>
<td>0</td>
</tr>
<tr>
<td>GA 4</td>
<td>0</td>
</tr>
<tr>
<td>GA 5</td>
<td>0</td>
</tr>
<tr>
<td>GA 6</td>
<td>0</td>
</tr>
<tr>
<td>GA 7</td>
<td>0</td>
</tr>
<tr>
<td>GA 8</td>
<td>0</td>
</tr>
</tbody>
</table>
Evidence to be Presented by the Program in terms of student outcomes

<table>
<thead>
<tr>
<th>Self-study Report</th>
<th>Displays On-Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Demonstrate relationship between the program educational objectives and the graduate attributes.</td>
<td>1) Records of meetings on formation and revision of the graduate attributes.</td>
</tr>
<tr>
<td>2) Demonstrate the program’s graduate attributes encompasses EAC 2016 graduate attributes.</td>
<td>2) All records and assessments on related engineering courses and capstone course.</td>
</tr>
<tr>
<td>3) Demonstrate achievement of graduate attributes through capstone course.</td>
<td>3) Related questionnaires and surveys from graduates.</td>
</tr>
<tr>
<td>4) Demonstrate achievement of graduate attributes though graduate surveys.</td>
<td></td>
</tr>
</tbody>
</table>

Note: Excerpts from Criterion 3 of the Supplement of Accreditation Criteria for Accrediting Engineering Programs.
# Capstone Assessment (Student Teams)

Course: Civil Engineering Capstone Project  
Student: Team A/ Smart, Smith, Springfield  
Topic: Design of Tamkang Bridge  
Year: Junior (2nd Semester)

<table>
<thead>
<tr>
<th>#</th>
<th>Graduate Attribute</th>
<th>Weight</th>
<th>Score</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ability to apply knowledge of mathematics, science, and engineering</td>
<td>10%</td>
<td>90</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>ability to design and conduct experiments, as well as to analyze and interpret data</td>
<td>15%</td>
<td>80</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>ability to apply techniques, skills, and modern tools necessary for engineering practice</td>
<td>20%</td>
<td>70</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>ability to design an engineering system, component, or process</td>
<td>20%</td>
<td>90</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>ability to manage project, including budgeting, communicate effectively, work in multi-disciplinary environment, and function on teams</td>
<td>10%</td>
<td>80</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>ability to identify, formulate, research literature and analyses complex engineering problems reaching substantial conclusions</td>
<td>8%</td>
<td>80</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>knowledge of contemporary issues; an understanding of the impact of engineering solutions in an environmental, societal, and global context; and the ability and habit to engage in life-long learning; and</td>
<td>10%</td>
<td>87</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice, and a sense of respect for diversity</td>
<td>7%</td>
<td>85</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>82</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Capstone Assessment (Whole Class)

<table>
<thead>
<tr>
<th>#</th>
<th>Graduate Attribute</th>
<th>Weight</th>
<th>Team A</th>
<th>Team B</th>
<th>Team C</th>
<th>Team D</th>
<th>Team …</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ability to apply knowledge of mathematics, science, and engineering</td>
<td>10%</td>
<td>90</td>
<td>90</td>
<td>91</td>
<td>89</td>
<td>…</td>
<td>90</td>
</tr>
<tr>
<td>2</td>
<td>ability to design and conduct experiments, as well as to analyze and interpret data</td>
<td>15%</td>
<td>80</td>
<td>67</td>
<td>87</td>
<td>74</td>
<td>…</td>
<td>80</td>
</tr>
<tr>
<td>3</td>
<td>ability to apply techniques, skills, and modern tools necessary for engineering practice</td>
<td>20%</td>
<td>70</td>
<td>85</td>
<td>90</td>
<td>85</td>
<td>…</td>
<td>88</td>
</tr>
<tr>
<td>4</td>
<td>ability to design an engineering system, component, or process</td>
<td>20%</td>
<td>…</td>
<td></td>
<td>…</td>
<td></td>
<td>…</td>
<td>68</td>
</tr>
<tr>
<td>5</td>
<td>ability to manage project, including budgeting, communicate effectively, work in multi-disciplinary environment, and function on teams</td>
<td>10%</td>
<td>…</td>
<td></td>
<td>…</td>
<td></td>
<td>…</td>
<td>72</td>
</tr>
<tr>
<td>6</td>
<td>ability to identify, formulate, research literature and analyses complex engineering problems reaching substantial conclusions</td>
<td>8%</td>
<td>80</td>
<td>75</td>
<td>80</td>
<td>75</td>
<td>…</td>
<td>85</td>
</tr>
<tr>
<td>7</td>
<td>knowledge of contemporary issues; an understanding of the impact of engineering solutions in an environmental, societal, and global context; and the ability and habit to engage in life-long learning; and</td>
<td>10%</td>
<td>87</td>
<td>80</td>
<td>93</td>
<td>80</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice, and a sense of respect for diversity</td>
<td>7%</td>
<td>85</td>
<td>78</td>
<td>90</td>
<td>85</td>
<td>…</td>
<td>86</td>
</tr>
</tbody>
</table>

**Team Score**
- Team A: 82
- Team B: 76
- Team C: 86
- Team D: 76
- Average: 80

*Must improve the training of GA 4 and 5*
# Graduate Survey (example)

<table>
<thead>
<tr>
<th>GA</th>
<th>Fullfillment</th>
<th>5 Highly Agree</th>
<th>4 Agree</th>
<th>3 Neutral</th>
<th>2 Disagree</th>
<th>1 Highly Disagree</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA 1</td>
<td>20%</td>
<td>36%</td>
<td>28%</td>
<td>10%</td>
<td></td>
<td>6%</td>
<td>3.54</td>
</tr>
<tr>
<td>GA 2</td>
<td>36%</td>
<td>38%</td>
<td>16%</td>
<td>6%</td>
<td></td>
<td>4%</td>
<td>3.96</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GA 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GA 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Criterion 4
Curriculum

4.1 Design and contents of the curriculum must be consistent with the PEOs, and the program must demonstrate through transcript analysis that coursework of each graduate includes the following three major components: mathematics and basic sciences, technical and professional engineering component, and general education. Specifically:

4.1.1 mathematics and basic sciences must account for at least 9 credits and total to at least one fourth of the credits required for graduation;

4.1.2 technical and professional engineering component must account for at least three eighths of the credits required for graduation including capstone design course.;

4.1.3 general education component must complement the technical contents of the discipline and be consistent with the PEOs;

4.2 Design and implementation of the curriculum must correlate the development of the industry and prepare students to culminate the learned knowledge and skills in engineering practice.
Curriculum Aims at Cultivating GA

Before
Professor-based Curriculum

Now
Student Outcomes-based Curriculum
Curriculum Mapping Must be Consistent with PEOs and Meets the Industry Needs
Every Course Must Correspond with GA

<table>
<thead>
<tr>
<th>Course</th>
<th>GA 1: ability to apply knowledge of mathematics, science, and engineering</th>
<th>GA 2: ability to design and conduct experiments, as well as to analyze and interpret data</th>
<th>GA 3: ability to apply techniques, skills, and modern tools necessary for engineering practice</th>
<th>GA 4: ability to design an engineering system, component, or process</th>
<th>GA 5: ability to manage project, including budgeting, communicate effectively, work in multi-disciplinary environment, and function on teams</th>
<th>GA 6: ability to identify, formulate, research literature and analyses complex engineering problems reaching substantial conclusions</th>
<th>GA 7: knowledge of contemporary issues; an understanding of the impact of engineering solutions in an environmental, societal, and global context; and the ability and habit to engage in life-long learning;</th>
<th>GA 8: apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice, and a sense of respect for diversity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Graphics</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Basic Design</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
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<tr>
<td>Fluid mechanism</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
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<td>*</td>
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<tr>
<td>Engineering Mathematics</td>
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<tr>
<td>Structural Mechanism</td>
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</tr>
<tr>
<td>Capstone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>
Table 4-4 Year 2016 Capstone Syllabus

(Please present other course information either on-site or electrically with each course having its syllabus, 2 samples of assignments, quizzes, exams, homework, etc. categorized by score of high, middle, and low.)

<table>
<thead>
<tr>
<th>Course name</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits/hour</td>
<td>Required/elective</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perquisite</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Textbook</th>
</tr>
</thead>
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<table>
<thead>
<tr>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
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<tr>
<td>3.</td>
</tr>
</tbody>
</table>

**Corresponding graduate attributes**

| 1. |
| 2. |
| 3. |
| ... |

**Assessment method:**

- □ Quiz
- □ Midterm
- □ Final
- □ Homework
- □ Report
- □ Oral report
- □ Project
- □ Oral test
- □ other: ____
Course Portfolios

Display at the on-site visit (for each course)

- Course Syllabus (match GA)
- Middle term exam (Sample of student exam by grades)
- Final exam (Sample of student exam by grades)
- Other (for example homework)
- Feedback of teaching staff

Beginning of semester

End of semester
## Transcript Analysis!

Have the students taken sufficient credits satisfying C4?

IEET-EAC as example

### Table 4-3 Year 2011-2016 Transcript Analyses

<table>
<thead>
<tr>
<th>Enrollment Year</th>
<th>Course name</th>
<th>Required/elective</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Semester Freshman</td>
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<td></td>
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</tr>
<tr>
<td>2nd Semester Freshman</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1st Semester Sophomore</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Semester Sophomore</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Semester Junior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Semester Junior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Semester Senior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Semester Senior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capstone Course</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Math</th>
<th>Basic science</th>
<th>Engineering course</th>
<th>General education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Theory</td>
<td>Design</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Required Course Credits Taken</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand Total</td>
<td></td>
</tr>
</tbody>
</table>

IEET Criterion 4 Curriculum Credits Requirement

- 32 Credits (Math and Science each must have 9 credits)
- 48 Credits

Minimum Program Graduation Credits
Table 4-4 Year 2016 Capstone Syllabus
(Please present other course information either on-site or electrically with each course having its syllabus, 2 samples of assignments, quizzes, exams, homework, etc. categorized by score of high, middle, and low.)

<table>
<thead>
<tr>
<th>Course name</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits/hour</td>
<td>Required/elective</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perquisite</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Textbook</th>
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</table>

<table>
<thead>
<tr>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
</tr>
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<td>3.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Corresponding graduate attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
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<tr>
<td>3.</td>
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<tr>
<td>...</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment method:</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Quiz ☐ Midterm ☐ Final ☐ Homework ☐ Report ☐ Oral report</td>
</tr>
<tr>
<td>☐ Project ☐ Oral test ☐ other: ____</td>
</tr>
</tbody>
</table>
Every Course Must Correspond GA

<table>
<thead>
<tr>
<th>Course</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Graphics</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
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<td></td>
<td>*</td>
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<tr>
<td>Basic Design</td>
<td>*</td>
<td>*</td>
<td>*</td>
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<td>*</td>
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<tr>
<td>Fluid mechanism</td>
<td>*</td>
<td>*</td>
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<tr>
<td>Engineering Math</td>
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<tr>
<td>Structural Mechanism</td>
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<tr>
<td>Capstone</td>
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</tbody>
</table>

Only 1 course matches GA #6: Must Reconsider!
Capstone Must Correspond with Most, if not all GA

<table>
<thead>
<tr>
<th>Course</th>
<th>1: ability to apply knowledge of mathematics, science, and engineering</th>
<th>2: ability to design and conduct experiments, as well as to analyze and interpret data</th>
<th>3: ability to apply techniques, skills, and modern tools necessary for engineering practice</th>
<th>4: ability to design an engineering system, component, or process</th>
<th>5: ability to manage project, including budgeting, communicate effectively, work in multi-disciplinary environment, and function on teams</th>
<th>6: ability to identify, formulate, research literature and analyses complex engineering problems reaching substantial conclusions</th>
<th>7: knowledge of contemporary issues; an understanding of the impact of engineering solutions in an environmental, societal, and global context; and the ability and habit to engage in life-long learning;</th>
<th>8: apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice, and a sense of respect for diversity</th>
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<tbody>
<tr>
<td>Engineering Graphics</td>
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</tbody>
</table>
Evidence to be Presented by the Program in terms of teaching and student work

<table>
<thead>
<tr>
<th><strong>Self-study Report</strong></th>
<th><strong>Displays On-Site</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Demonstrate a curriculum map (Must include guidelines on prerequisites.)</td>
<td>1) Curriculum map.</td>
</tr>
<tr>
<td>2) Provide a yearly listing of courses offered and demonstrate the courses’ alignment with the graduate attributes.</td>
<td>2) Lists and portfolios of professional courses including:</td>
</tr>
<tr>
<td>3) Demonstrate curriculum can cultivate achievement of graduate attributes with each attribute cultivated by at least 2 to 3 courses.</td>
<td>• Syllabus, list of textbooks used, and sample of tests and homework organized by score of high, middle, and low with 2 of each.</td>
</tr>
<tr>
<td>4) Demonstrate student fulfillment of curriculum requirements of criteria 4.1.-4.1.3. using transcript analysis.</td>
<td>• Instructor self-made handouts if any.</td>
</tr>
<tr>
<td>* Minimal credits required for graduation are set by the Ministry of Education, which is 128.</td>
<td>• Sample of midterm and final examinations organized by score of high, middle, and low with 2 each.</td>
</tr>
<tr>
<td></td>
<td>• Sample of homework organized by score of high, middle and low with 2 each.</td>
</tr>
<tr>
<td></td>
<td>• Course analysis table.</td>
</tr>
<tr>
<td></td>
<td>3) Transcript of graduates.</td>
</tr>
<tr>
<td></td>
<td>4) Syllabus of capstone courses and sample of finished project/report organized by score of high, middle, and low with 2 of each.</td>
</tr>
<tr>
<td></td>
<td>5) Student ranking based on overall scores for each class years.</td>
</tr>
</tbody>
</table>
## Course Analysis and Teaching Staff Feedbacks

### A. Required Courses

| Course number | Course name | Required/elective | Instructor | Year to be taken | Total | Math | Basic Science | Engineering | Theory | Design | Number of hours | Attribute 1 | Attribute 2 | Attribute 3 | Attribute 4 | Attribute 5 | Attribute 6 | Attribute 7 | Attribute 8 | Number of students | Assessment method | Average score | Rate of passage |
|---------------|-------------|-------------------|------------|------------------|-------|------|--------------|-------------|--------|--------|-----------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|-------------------|--------------|-----------------|
| 1             |             |                   |            |                  |       |      |              |             |        |        |                 |             |               |             |             |             |             |             |             |               |                 | Quiz | Midterm | Assignment | Report | Oral report | Project | Oral test |
|               |             |                   |            |                  |       |      |              |             |        |        |                 |             |               |             |             |             |             |             |             |               |                 | Final | Assignment | Report | Oral report | Project | Oral test |
|               |             |                   |            |                  |       |      |              |             |        |        |                 |             |               |             |             |             |             |             |             |               |                 | Other | Other | Other | Other | Other | Other | Other | Other | Other |

(Please insert course assessment and analysis)
Criterion 9
Continuous Improvement

- Students have attained the graduate attributes by graduation;
- Planning and implementation of the curriculum must correlate the development of the industry and prepare students to culminate the learned knowledge and skills in engineering practice;
- Continuous improvements are attained in other areas.
Continuous Improvement of the Program

1. Mechanism (Committees & Frequency of Meetings)
   - Inner Loop
     - Curriculum Committee
     - Environment, Safety, and Hygiene Committee
     - ...
   - Outer Loop
     - Advisory Committee
     - ...

2. Effects of the Mechanism
   - Meeting Minutes
     - Inner Loop Committees
     - Outer Loop Committees
   - Execution of the Meeting Decisions
     - Inner Loop Committees
     - Outer Loop Committees
### Reflect on Weak Attributes and their Corresponding Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>GA 1</th>
<th>GA 2</th>
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<td>Engineering Mathematics</td>
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1. ability to apply knowledge of mathematics, science, and engineering
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7. knowledge of contemporary issues; an understanding of the impact of engineering solutions in an environmental, societal, and global context; and the ability and habit to engage in life-long learning;
8. apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice, and a sense of respect for diversity
Curriculum Committee Serves its Function

Student Outcomes-based Curriculum

Does the curriculum committee serve its function?
Advisory Board Review Assessment Results

• Understand results from PEO surveys
• Understand results from GA assessments
• Suggest other improvement
Teaching and Curriculum Adjustment

- Based on PEO survey results, GA assessment results, curriculum committee discussions, advisory board discussions to adjust curriculum and assessment
Happy New Year 2020