

King Fahd University of Petroleum and Minerals
Computer Engineering Department

**ABET ACCREDITATION FOR THE
COMPUTER ENGINEERING PROGRAM**

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KFUPM University Mission

- **Preparing professionals empowered with the knowledge, skills, values and confidence to take a leadership role in the development of the Kingdom in the fields of science, engineering, environmental design and business.**
- **Producing research that contributes to the knowledge and sustainable development of the Kingdom and region by providing innovative solutions to identified economic and technical problems and opportunities.**
- **Providing a stimulating campus environment for the welfare of its students, faculty and staff, and offering outstanding professional services and out-reach programs to the society at large.**

CCSE College Mission

- **To prepare competent professionals in the areas specified in the college line of business who are competitive worldwide and will be the leaders in Saudi industry, academia and government.**
- **To conduct innovative basic and applied research that advances the frontiers of knowledge and address local problems.**
- **To provide high quality service to society in the areas of applied projects, consultation and training.**

Computer Engineering Mission

COE Mission

- To develop and train the human intellect needed for meeting the continued technological advances in the discipline of Computer Engineering and IT-related areas.

Program Educational Objectives (PEOs)

ABET: Career and professional accomplishments that the program is preparing graduates to achieve.

Program Educational Objectives

To produce computer engineering graduates prepared to:

- **PEO-1: Practice their profession with confidence and global competitiveness and make intellectual contributions to it;**
- **PEO-2: Pursue a life-long career of personal and professional growth with superior work ethics and character and**
- **PEO-3: Pursue advanced study and research at the graduate level.**

Program Outcomes (POs)

ABET: What students are expected to know and be able to do by the time of graduation.

Program Outcomes:

- **(a) an ability to apply knowledge of mathematics, science, and engineering**
- **(b) an ability to design and conduct experiments, as well as to analyze and interpret data**
- **(c) an ability to design a system, component, or process to meet desired needs**
- **(d) an ability to function on multi-disciplinary teams**

Individuals with similar educational backgrounds focusing on different aspects of a project as well as teams of individuals with different educational backgrounds.

- **(e) an ability to identify, formulate, and solve engineering problems** ⁷

Program Outcomes (Cont)

- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning

Teaching students that the underlying theory is important because the technology will change, coupled with enhancing their self-learning ability.

Program Outcomes (Cont)

- (j) knowledge of contemporary issues

The impact of globalization, the outsourcing of both engineering and other support jobs as practiced by modern international companies.

- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Department specific:

- (l) Knowledge of Probability and Statistics and their applications in Computer Engineering
- (m) Knowledge of Discrete Mathematics
- (n) The ability to design a system that involves the integration of hardware and software components

The Constituents

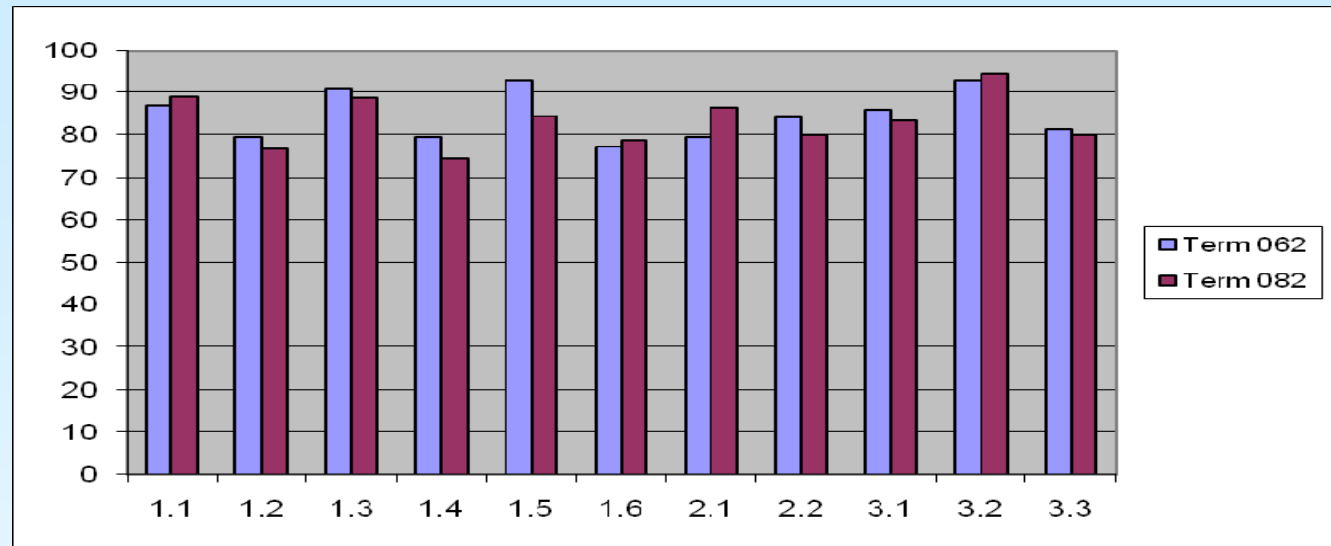
- **Faculty**
- **Students**
- **Alumni**
- **Employers**
- **Industry Advisory Committee**

Mapping of POs to PEOs

Program Educational Objectives	Program Outcomes
1. Practice profession with confidence and global competitiveness and make intellectual contributions to it	a, b, c, d, e, g, k, l, m , n
2. Pursue a life-long career of personal and professional growth with superior work ethics and character	f, i, h, j
3. Pursue advanced study and research at the graduate level	a, b, e, g, i, k

Alumni Survey

VSSN Alumni satisfaction percentile vs PEO-1, PEO-2, and PEO-3



PEO-1

1. adequate background to practice my profession as a computer engineer with confidence.
2. adequate background to be globally (worldwide) competitive in my profession.
3. adequate background to make intellectual contribution to my profession.
4. adequate background to improve my personal skills (e.g., teamwork, leadership, oral and written communication skills, etc) in the work place.
5. adequate technical breadth.
6. adequate technical depth.

PEO-2

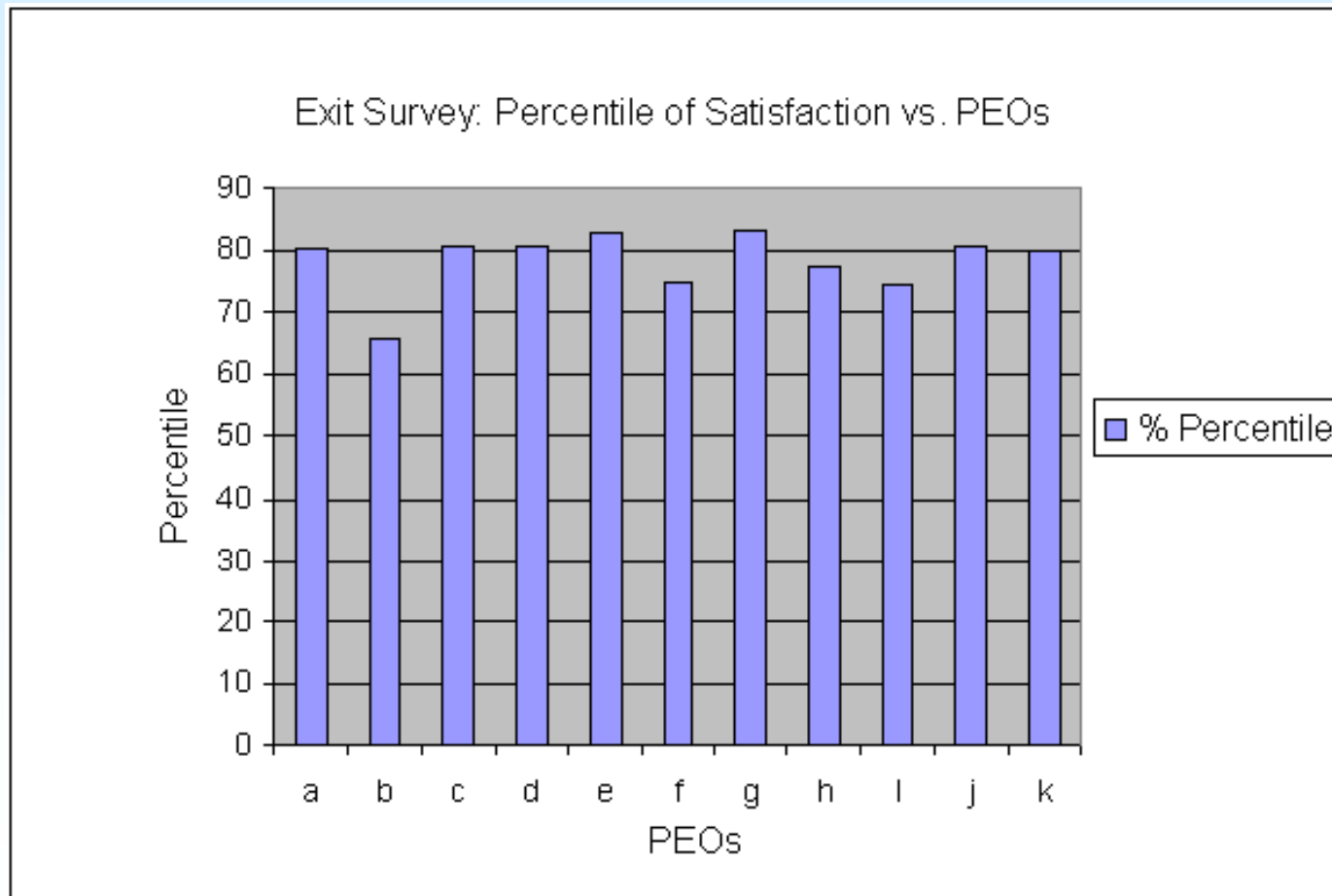
1. adequate opportunities to help me understand and appreciate the importance of superior work ethics in the practice of my profession.
2. adequate opportunities to help me understand and appreciate the importance of good character in the practice of my profession.

PEO-3

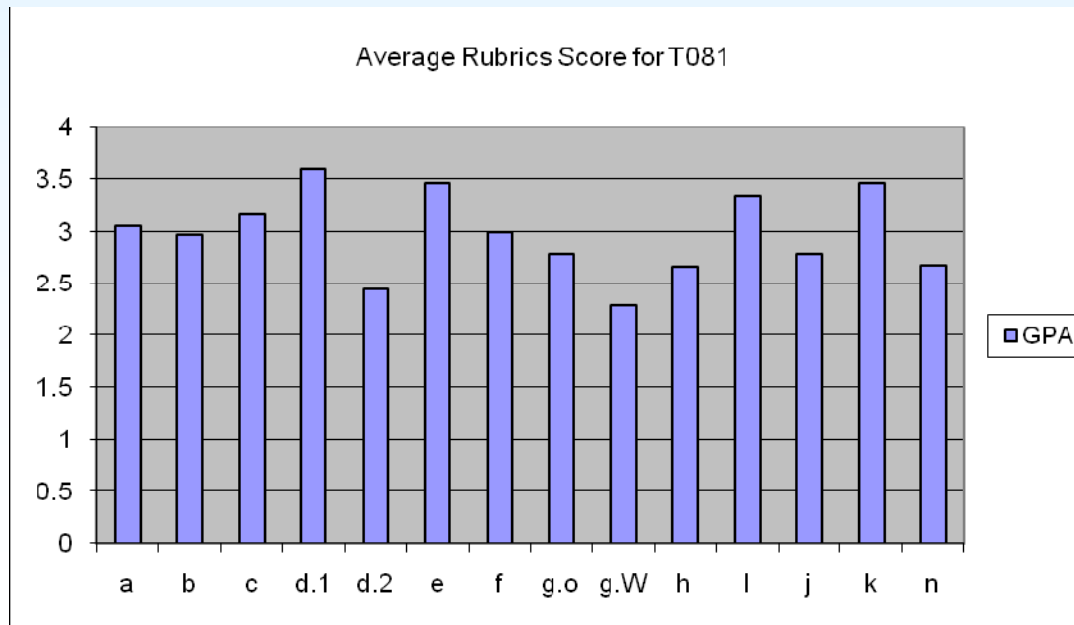
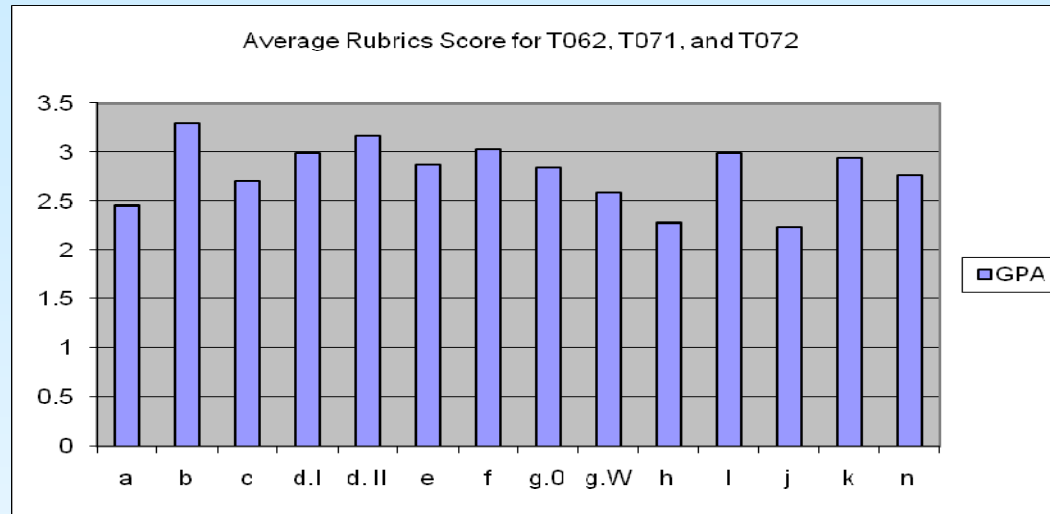
1. adequate ability and motivation to continuously improve my technical skills.
2. adequate training for professionally adapting myself to changes in my field.
3. adequate background that I can build on to continue higher studies for the MS and PhD degrees.

Exit Survey

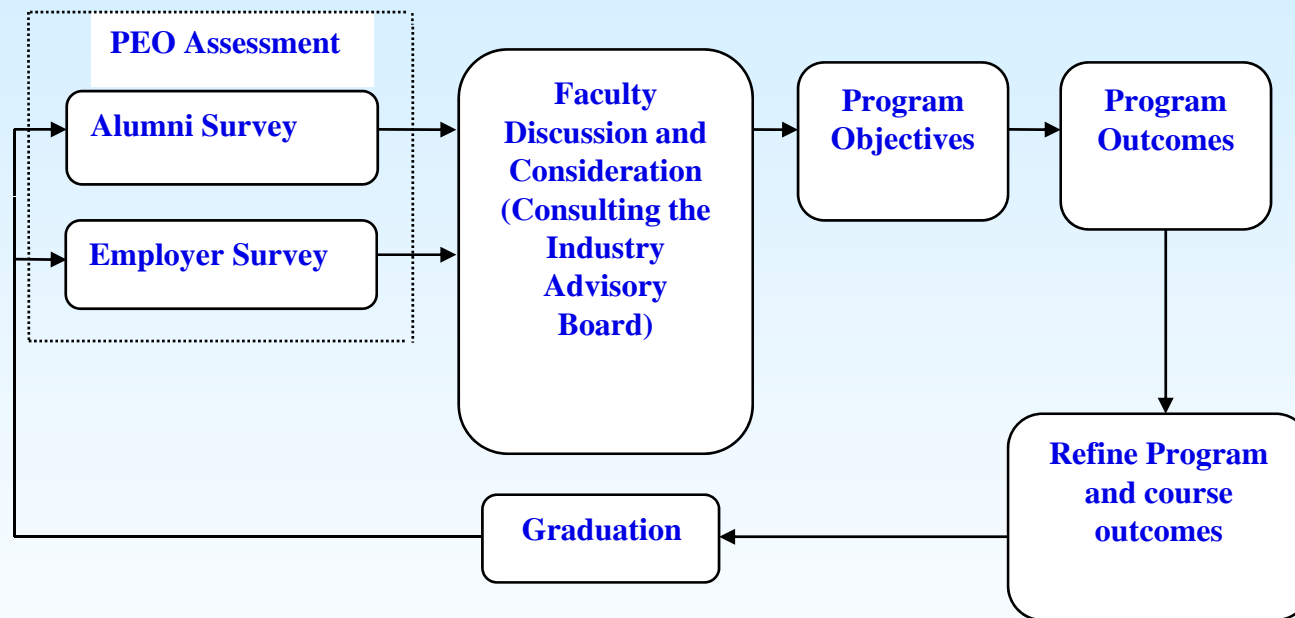
Exit Survey: Percentile of Satisfaction vs.



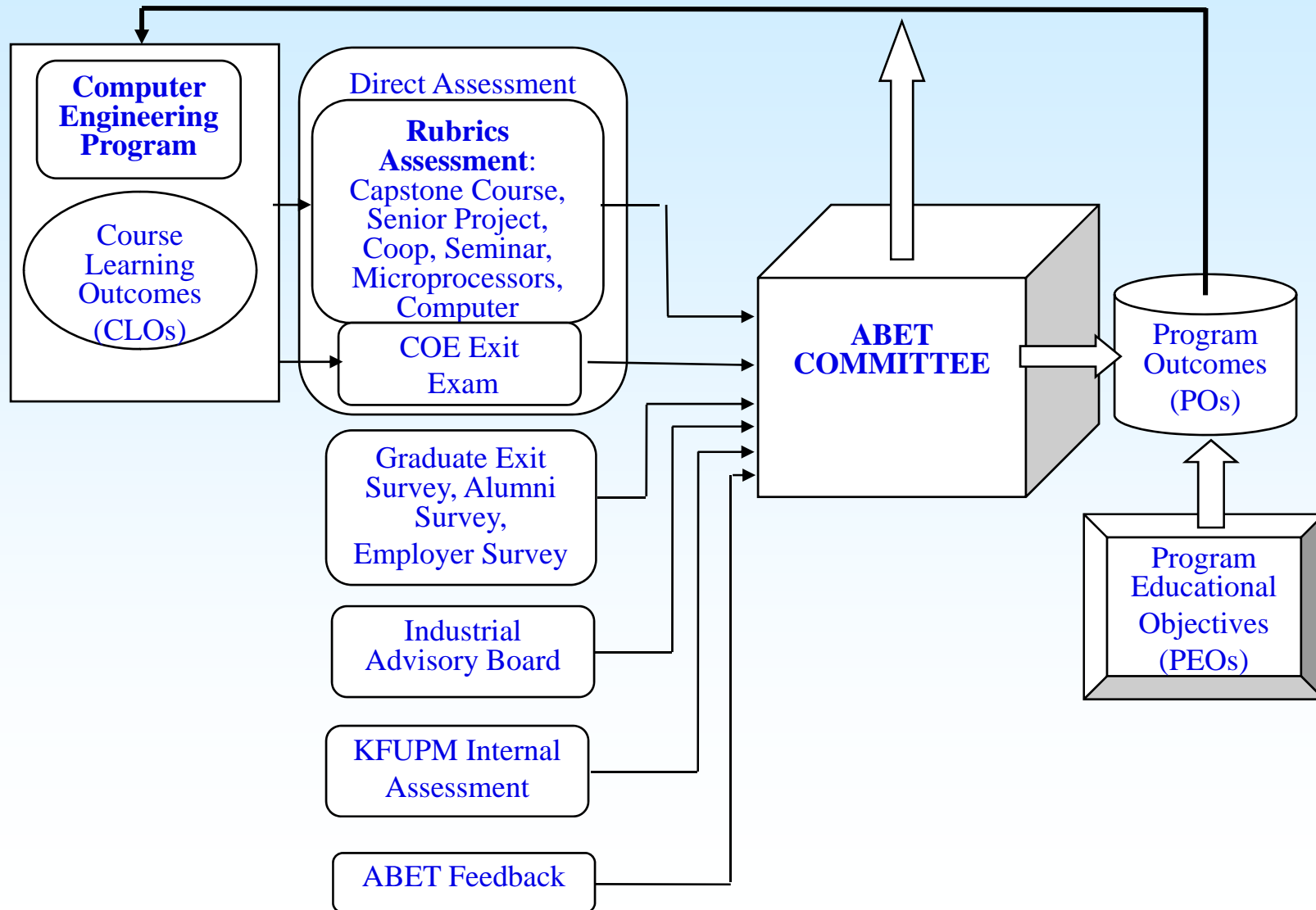
Rubrics Assessment: Evaluation by Faculty in some



PEOs Assessment and Evaluation



POs Assessment: Tools and Method



Assessment Plan

Planning the Evaluation of the PEOs and POs.

Planning of the PEOs and POs Evaluation Process and Frequency	2006-2007 (T061-062)	2007-2008 (T071-072)	2008-2009 (T081-082)	2009-2010 (T091-092)
Evaluation of PEOs (every 3 years)	X			X (Surveys : T081 and T082)
Evaluation of the POs (every 3 years)	X			X

Planning the Indirect Assessment and Consulting the IAC.

Planning the POs Indirect Assessment	T081	T082	T091	T092	T101	T102	T111	T112
Survey of Alumni and Employers (every 3 years)	X	X					X	X
Survey of COE Graduates and Coop Supervisors (every semester)	X	X	X	X	X	X	X	X
Meeting and consulting the IAC (every year)		X		X		X	X	X

Closing the Loop

Planning the Continuous Improvement and Program Assessment.

Planning Continuous Improvement and Program Assessment	T081	T082	T091	T092	T101	T102
<p>Analysis of POs performance:</p> <ul style="list-style-type: none"> • Direct and Indirect Assessment Data. • C(design), E(formulation), D(teamwork), G(communication), J(contemporary), L(statistics), and N(integration). 	X		X			
<p>Analysis of POs performance:</p> <ul style="list-style-type: none"> • Direct and Indirect Assessment Data. • A(math/science), B(experiments), F(ethics), H(eng. sol.), I(learning), K(tools), and M(dis. math). 		X		X		
<p>Program Assessment (Direct Assessment: Rubrics and Exit Exam)</p>					X	X

Note: Assessment data is serving to evaluate effectiveness of previous continuous improvement as well as serving in the next two years to find out which POs need improvements.

Continuous Improvement

Improving the Eng. Design (Outcome c) in T081

Program outcomes assessment and evaluation plan.

Program Outcome	Assessment & Evaluation Methods	Performance Target	Level of achievement (T081 and T082)	Achievement of the Outcome
(c) an ability to design a system, component, or process to meet desired needs	Rubric assess. through COE 400, COE 485 and COE 351	A score ≥ 2.5 out of 4	Score of 2.71 for T062, 071, 072 Score of 3.17 for T081	Marginally above target score till T081.
	Exit Survey	A score ≥ 3 out of 5	A score of 4.05/5	Students rated their learning as very good
	Coop Employer Survey	A score ≥ 3 out of 5	Score of 4/5	Very good

Conclusion

- **The COE department is seeking accreditation from ABET EC 2008-09 as a strategy to provide quality assurance for its BSc Program.**
- **New instruction techniques for outcome-based education will be gradually attempted at some levels to improve the quality of the Computer Engineer compared to some international standard.**
- **The Industrial Advisory Board is one channel to provide the department with feedback on the achievement of educational objectives as experienced by the COE graduates.**

Thank you