

Assessment Experience in Learning Outcomes and the Student Criterion

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Institution and EE Program



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Howard University's School of Engineering and Sciences
Department of Electrical and Computer Engineering

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Electrical and Computer Engineering both continue to be attractive professions that are in great demand. They have rich traditions in design, development, testing and commercialization of cellular and information highway technology, command, control and delivery of power of high-speed machines, digital networks, microprocessors and supercomputers, of materials such as superconductors and bio-materials, and VLSI circuits for consumer and industrial electronic applications. Electrical and Computer Engineering continue to make an impact on wireless communications, networking and nanotechnology emerging industries.

Howard's School of Engineering is among the top schools in the nation

- Chair Welcome
- About ECE
- Vision & Mission
- Educational Objectives
- Admissions
- Degree Programs
 - BS Electrical Engineering
 - BS Computer Engineering
 - MS Electrical Engineering
 - Ph.D. Electrical Engineering

Table of Contents

- ❑ ABET in 2000
 - ✓ Weaknesses
 - ✓ New Mechanism
- ❑ Repair Process
 - ✓ Feedback Loop in to the mechanism
 - ✓ Advising Kit
- ❑ Assessment Under new Mechanism
 - ✓ Learning Outcome Assessment by Exit Survey and Course Survey
 - ✓ Results and Lessons
- ❑ New Advising Tool development
 - ✓ Web-based SEAM (Student Evaluation, Advising, and Monitoring) system

ABET in 2000 (Fall)

❑ Poor Understanding

- ✓ Outcomes
- ✓ Objectives

❑ One man show

- ✓ Chair driven efforts
- ✓ No ABET trained faculty member

❑ ABET visit (Deficiency, Weakness, Concern, Observation)

- ✓ 2 weaknesses – “minimal feedback mechanism” and “limited assessment process”
- ✓ 1 observation – “display more of capstone projects”

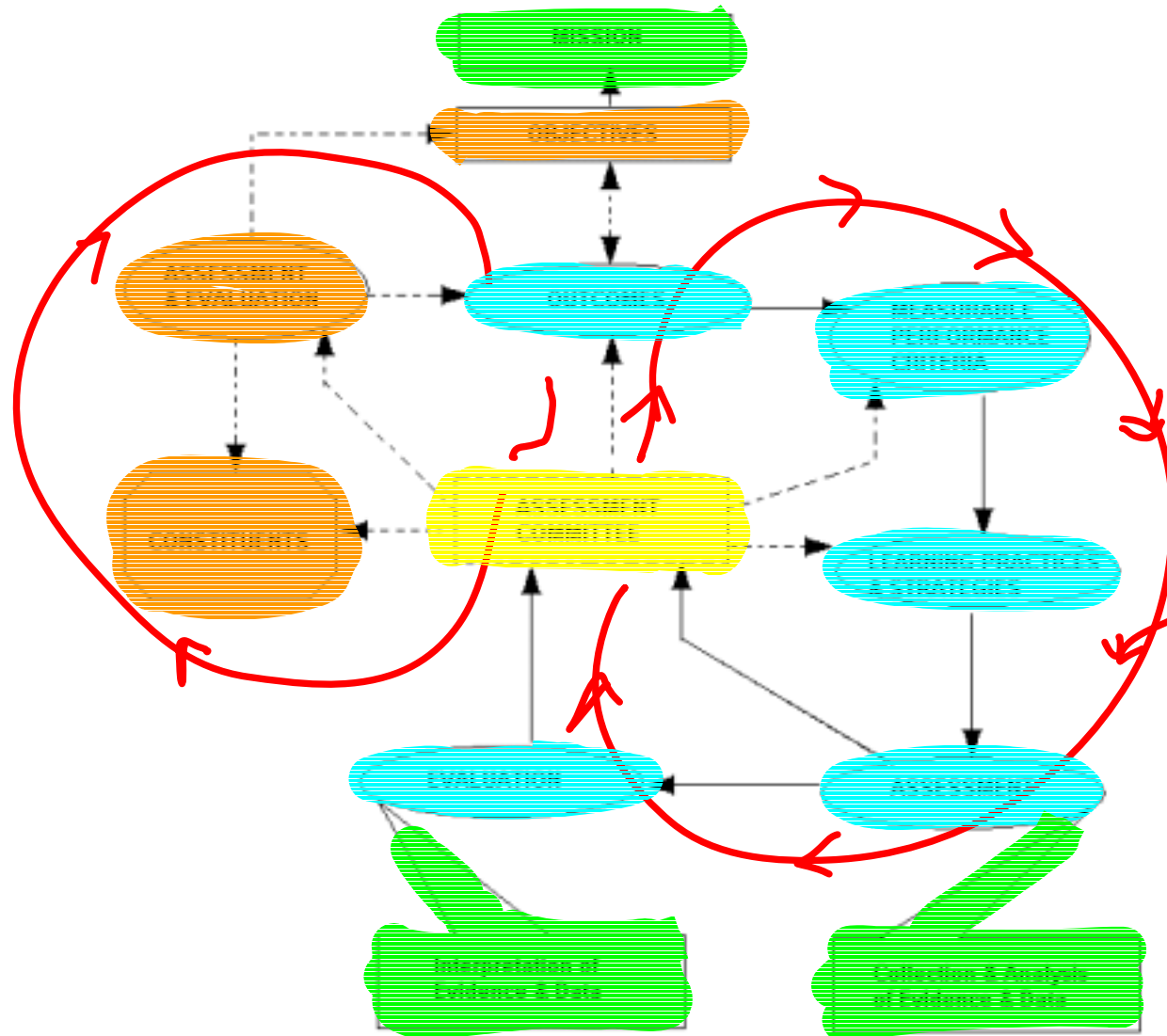
❑ ABET Accreditation Action

- ✓ Interim Visit

Repair Process (until May 2002)

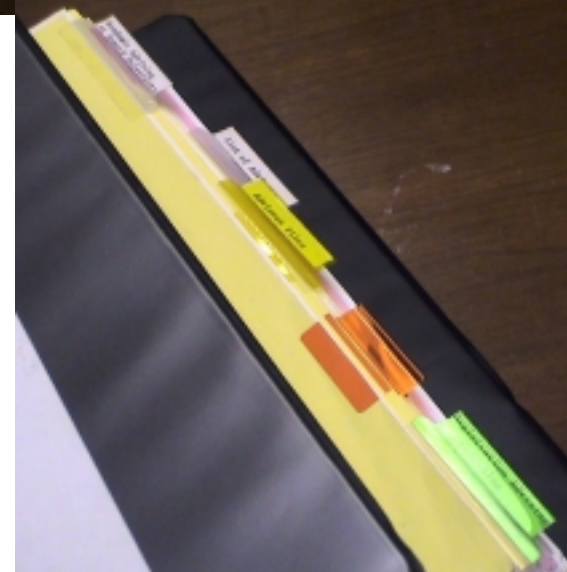
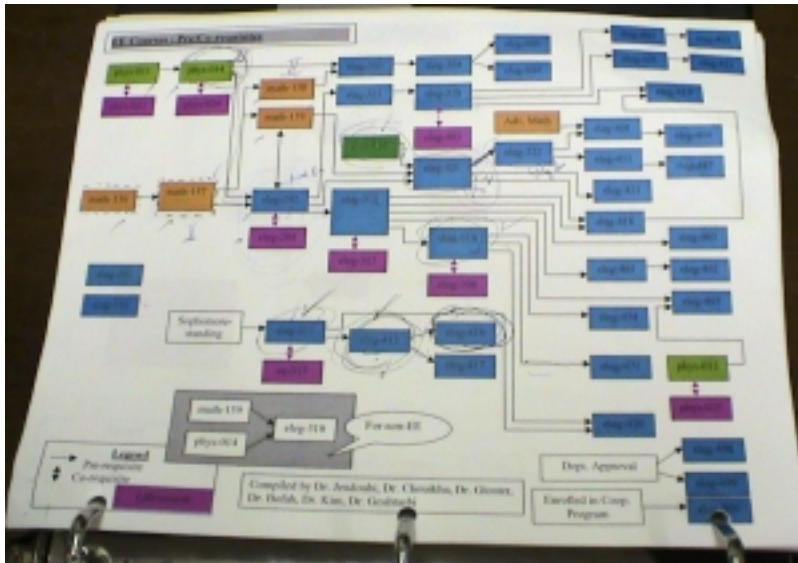
- ❑ Formation of Assessment Committee
 - Chair and 3 members
 - Dept Chair as ex-officio
- ❑ Development of New Mechanism
 - Closed Loop
 - Inclusion of Constituents
 - Measurable metric for outcome evaluation
 - Advising Kit to faculty
- ❑ Result of the Interim Visit
 - Full Accreditation until 2007

New Assessment Mechanism



Advising Kit and SAB/IAB

- ❑ Advising Kit for faculty (Yr 2002)
 - 3" binder with advisee students
 - Advising Policy
 - Registration Advising Guide
 - Advising Files
 - Pre- and Co- Requisite Chart
- ❑ Advisory Boards
 - Student Advisory Board
 - Industry Advisory Board



Assessment Experience under New Mechanism

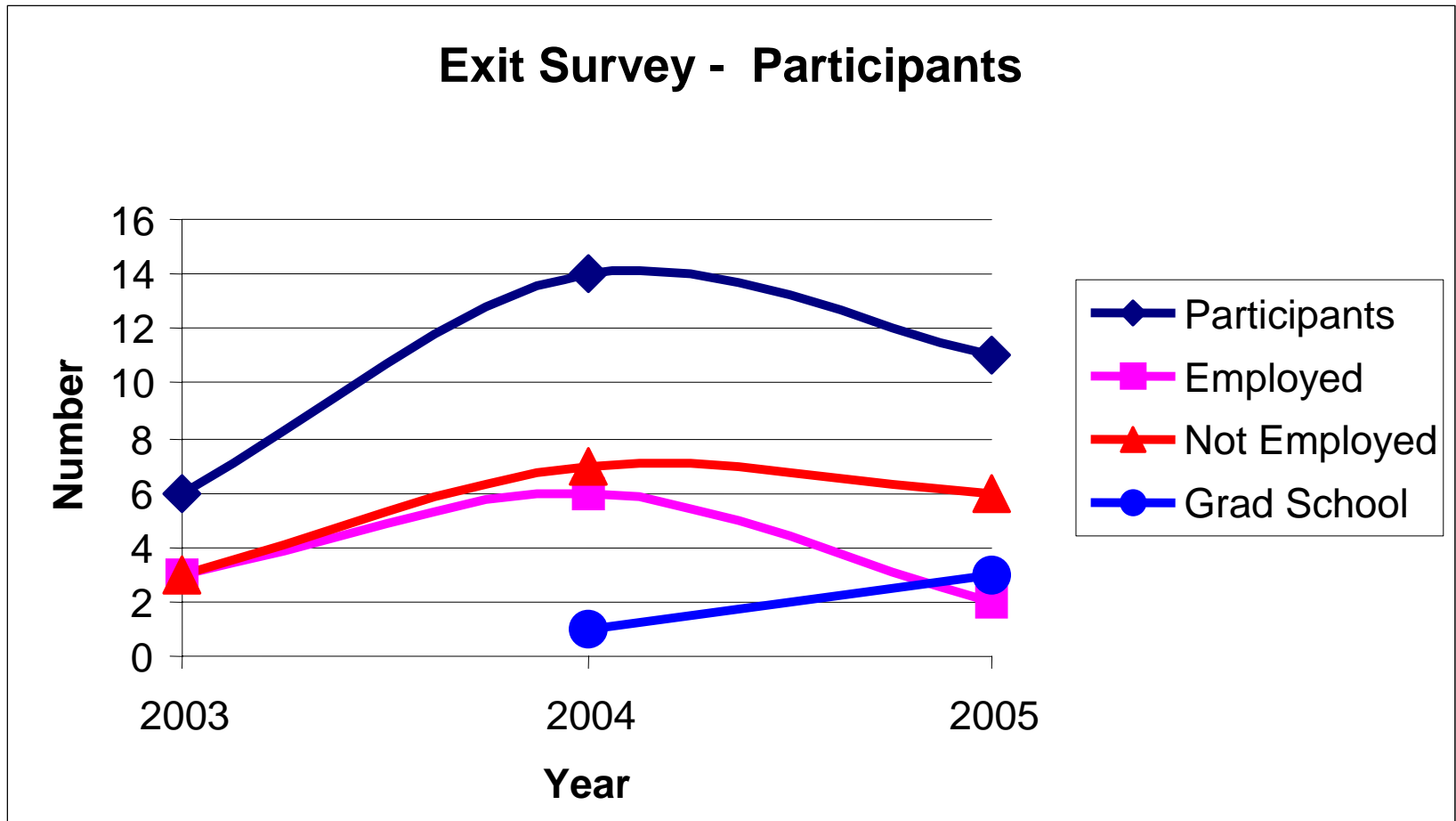
□ Faculty Course Teaching Survey

- Learning Outcomes Met?
- Objectives Well Targeted or Appropriate or Need of Revision?
- Faculty Inputs for Metrics, Students Strength in Pre-Req, etc

□ Exit Survey (for graduating Seniors)

- Every May
- Students' Response on Learning Outcomes
- Students' Feeling about Advising
- Students' Evaluation of Teaching Quality

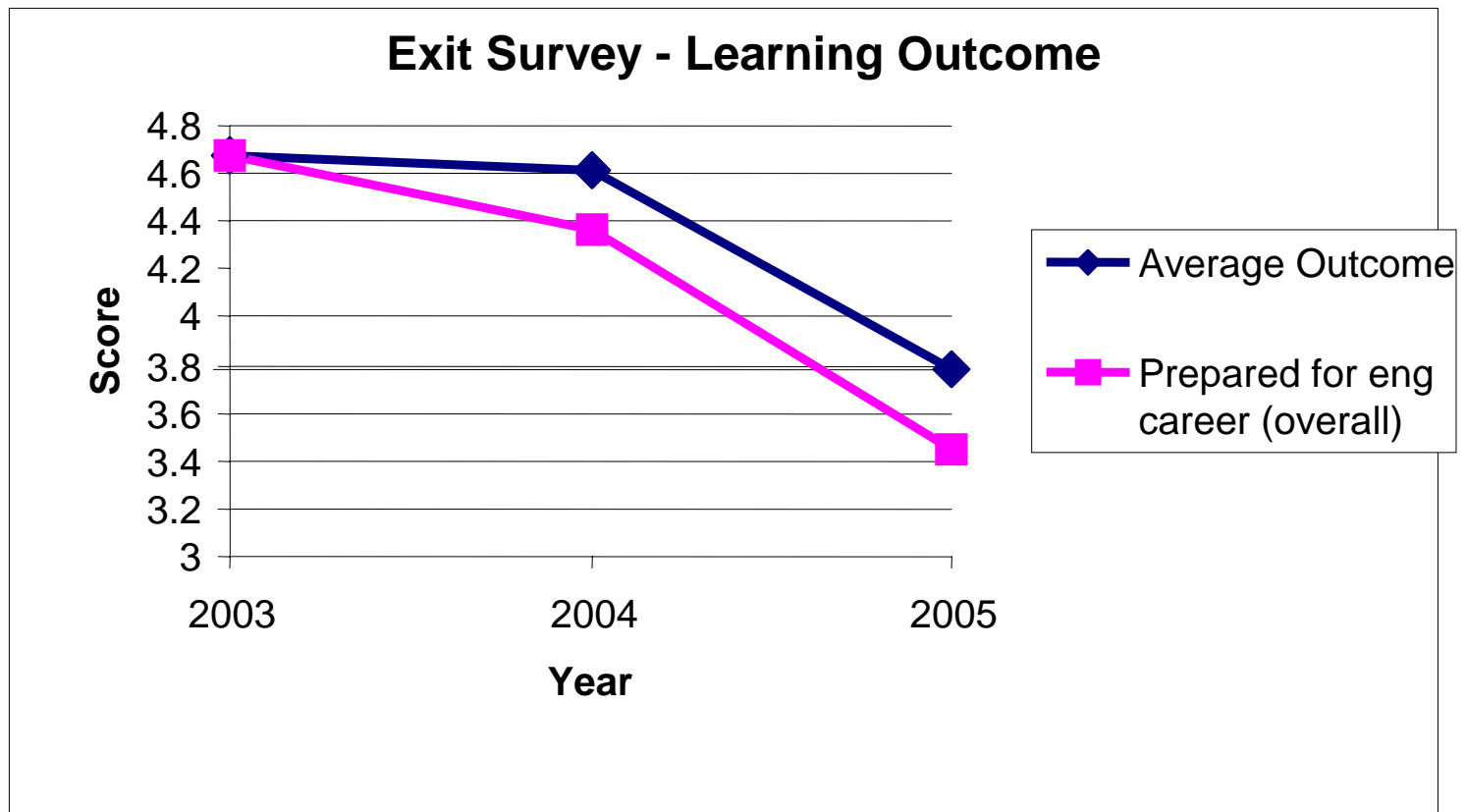
Exit Survey -Participants



Exit Survey-Outcomes

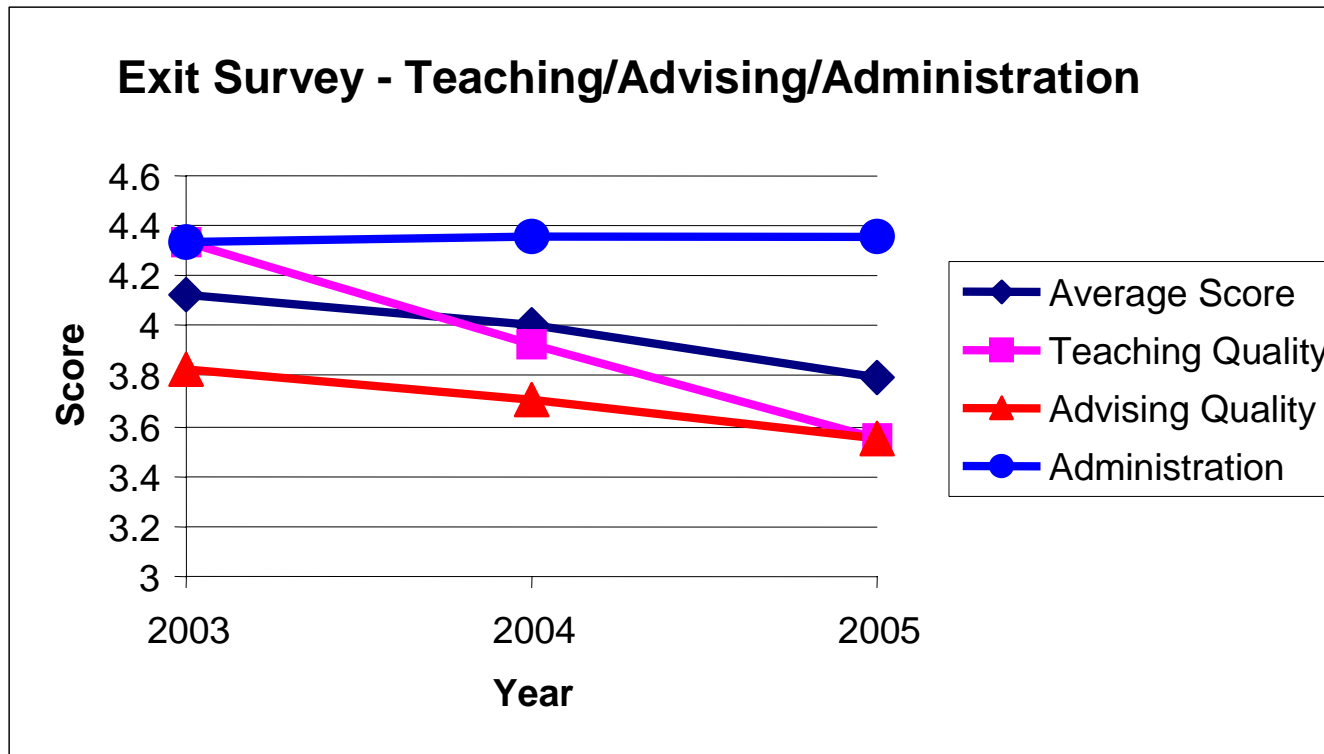
❑ Decreasing Performance

- [EXIT SURVEY 2005 Word File](#)



Exit Survey-Teaching/Advising/Administration

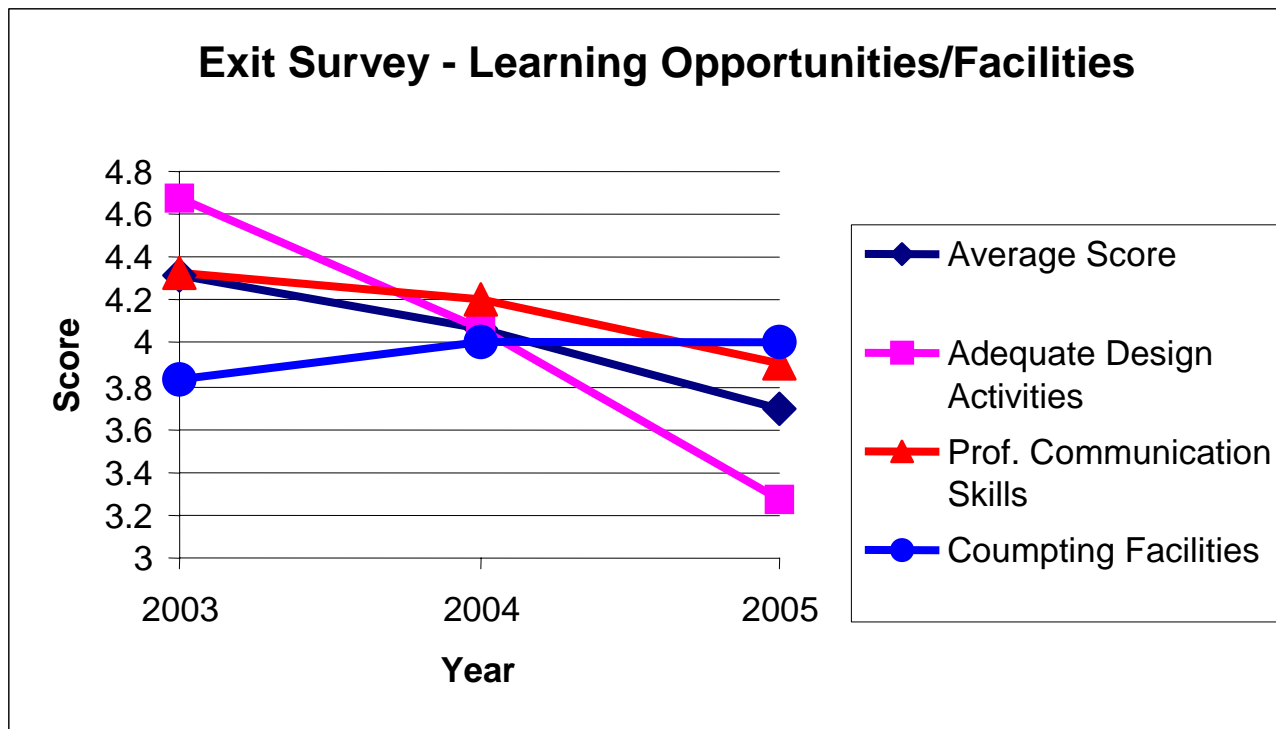
- ❑ Teaching/Advising declining
- ❑ Administration improving



Exit Survey

-Learning Opportunity/Facility

- ❑ Computing Facility improving
- ❑ Design Activities needs improvement



Exit Survey 2005 Details

- [EXIT SURVEY 2005 Word File](#)

Faculty Course Survey: Spring 2005

- ❑ Number of courses:8
- ❑ Number of lecturers: 6
- ❑ Findings
 - Most outcomes achieved
 - Lack of Math Background – most common problem
 - Adequate Room Size
 - Software tools: Matlab and CAD
- ❑ [Details of Course Survey Spring 2005](#)

Conclusion of the Assessment

□ Findings

- **Most outcomes are achieved (students and faculty)**
- **Most objectives are well connected**
- **Computing facilities are improved**
- **Teaching and Advising are chronic problems cited by students**
- **More Design activities are needed**

□ Recommendations for Betterment

- **Immediate and serious attention on teaching/advising is needed**
- **Streamlining Design Activities**
 - ✓ **Curriculum committee: investigation of introducing sophomore and junior design (1 cr) courses**
- **Every Semester Opening for a few core courses**
 - ✓ **Network 1, Electronics 1, etc**

Lessons Learned

- **ACHIEVEMENT**
 - Assessment Committee
 - Record Track- Data, history, continuity & sustainability
 - Under Limited Resources
- **AREAS TO IMPROVEMENT**
 - Matching, Mapping, Slow Process, Fast Process, etc
 - Faculty Knowledge Level – Less Enthusiastic Response
 - Faculty Load Problem – institution level
 - **“Bad Teaching” vs. “Weak Background” –Science course problems – retention issues**
 - Advising Kit - No Help At all
 - Prompted to develop web-based system (“SEAM”)
- **Departmental Challenge**
 - Challenge – **stimulating senior faculty member**
 - Challenge – **Lessening burdens on committee**
 - Chair’s additional load and burden

What we have done differently

- Knowledge Level Problem
 - Bring Together
 - Send More to Training, and Early
 - Start from What We Were Doing
 - Course Reduction for Committee Members
- **Assessment Tools and Methods**
 - Resources, Networks, and Helps
 - Attend BAPs
 - Grouping Together with Similar Size/Situation Programs

SEAM (Student Evaluation, Advising, and Monitoring) System

❑ Goals

- ❑ Easy Advising & Monitoring
- ❑ Easy Spotting of Problems
- ❑ Tracing advising itself – Record keeping, Leaving evidence

❑ Expected Impacts

- ❑ Anytime/Anywhere Advising
- ❑ Paperless System

❑ Development of SEAM

- ❑ Summer 2005 – Present
- ❑ A Unix Based Server
- ❑ Beta system is currently running

SEAM - Capabilities

□ Capabilities

- Curriculum Check (especially for Transferred Credits)
- Course Sequence Check and Alerting
- Instant E-mail Notification
- Advising using message/E-mail Possible
- Grade Uploading Possible – CEACS format
- Old-New course number/title matching

ELEG-EECE Course Matching Table

Note: updated (from 2006) course numbers are used for EECE courses in table

ELEG Course Number	EECE Course Number	Course Title
ELEG-101	EECE-101	Intro to Eng I
ELEG-102	EECE-102	Intro to Elec & Comp Eng
ELEG-120	EECE-120	Home Light ELDO
ELEG-200	EECE-200	Intro to Computer Engineering
ELEG-202	EECE-202	Network Analysis I
ELEG-204	EECE-204	Intro to Electrical Eng Lab
ELEG-206	EECE-206	Intro Computer Lab
ELEG-301	EECE-301	Network Analysis II
ELEG-303	EECE-304	Electromagnetic Theory I
ELEG-304	EECE-466	Adv Electromagnetic Theory
ELEG-307	EECE-313	Electronics I Lab
ELEG-308	EECE-314	Electronics II Lab
ELEG-310	EECE-310	Principles of Electronics
ELEG-311	EECE-211	Digital Systems Design
ELEG-315	EECE-307	Electronics I
ELEG-316	EECE-308	Electronics II
ELEG-317	EECE-317	Digital Systems Design Lab

SEAM (Beta Version)

□ Trial Run Underway

Student Record - Microsoft Internet Explorer

Address: http://www.colgate.com/~eece/sgp/adv.asp

You may browse all the students under advisor:

Woods | tabent

or

You may browse students

GPA: All | Gender: All | Nation: Nigeria, USA, Jamaica | Current Grade: Freshman, Sophomore, Junior, Senior | Scholarship: All | Major: All | Warning: All

tabent

Here is the brief information for all students

ID	First Name	M.	Last Name	Gender	Nationality	Scholarship	Major	Enrollment
1	Franklin	T	Wong	M	Nigeria	A scholarship	Electrical Engineering	0

								Did not take MATH-158 before EECE-304 ;
all	Electrical Engineering	7	3.00	Woods				Did not take EECE-307 with EECE-313 in same semester ; Did not take EECE-318 with EECE-324 in same semester ;
all	Electrical Engineering	10	1.60	Rice				GPA < 2.0 ; Did not take ENGL-002 before ENGL-003 ;
all	Electrical Engineering	15	3.80	Woods				Did not take EGPP-101 before EECE-102 ; Did not take EECE-202 before EECE-301 ; Did not take MATH-159 with EECE-202 in same semester ; Did not take PHYS-014 before EECE-202 ; Did not take EECE-208 with EECE-202 in same semester ; Did not take EECE-318 with EECE-324 in same semester ; Did not take EECE-332 before EECE-401 ; Did not take EECE-318 before EECE-401 ; Did not take EECE-304 before EECE-401 ; Did not take EECE-316 before EECE-401 ;
	Electrical Engineering	3	4.00	Johnson				Did not take EECE-102 before EECE-202 ; Did not take MATH-159 with EECE-202 in same semester ; Did not take PHYS-014 before EECE-202 ; Did not take EECE-208 with EECE-202 in same semester ;
								Did not take EECE-102 before EECE-202 ;

SEAM – Development Environment

- Server
 - DELL Dual Core Processor Server (*PowerEdge SC430*)
- Server OS
 - Linux (Fedora 4.0)
- Web Server
 - Apache 2.0
- Mail Server
 - Sendmail .12.11
- Database
 - MYSQL 5.0
- Database Programming Language
 - SQL and Perl
- Remote Access for Developer/Maintenance
 - Putty, SSH
- NOTE
 - Linux, Apache, Sendmail, Perl, MYSQL, Putty, SSH are the most popular open source tools for web based database system development.

