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APPENDIX D – INSTITUTIONAL SUMMARY

A. The Institution

1. **Name:** The City College of the City University of New York
   160 Convent Avenue, New York, NY 10031
2. **Chief Executive Officer:** Dr. Robert Paaswell, Interim President November 2009-July 2010
   Dr. Lisa Staiano-Coico, as of August 2010

B. Type of Control

The City College of New York is a public institution governed by the Board of Trustees of the City University of New York, a body with representatives appointed by the Governor of the State of New York and the Mayor of the City of New York. Dr. Matthew Goldstein is Chancellor of the City University of New York. Other state supported colleges and universities in New York, both 2 and 4-year schools, are structured under the State University of New York (SUNY) system, governed by a separate Board of Trustees that is appointed by the Governor of the State of New York.

C. History of Institution

The City College of New York, (CCNY) established in 1847, is the oldest campus of the City University of New York (CUNY) system and continues to be CUNY's flagship. The City College is one of 23 campuses in CUNY. The CUNY system has approximately 250,000 students in over 300 majors leading to the associate, baccalaureate or graduate degree. Over 4,000 courses are offered on CUNY campuses.

The CCNY Grove School of Engineering (GSOE) is the principal entity for engineering education within CUNY. Effective September 1962, the Board of Higher Education approved a change in the name of the School of Technology to the School of Engineering and Architecture. Later, effective July 1968, the Board of Higher Education approved the separation of the School of Engineering and the School of Architecture. In November 2005, the CUNY Board of Trustees approved a change in the name of the School of Engineering to the Grove School of Engineering.

The GSOE origins date from 1916, when the Board of Trustees authorized a curriculum leading to the Diploma of Junior Civil Engineer. In 1917, more extensive courses in chemical, civil, electrical, and mechanical engineering were established within the natural science curriculum of the College of Liberal Arts and Sciences. In 1919, the School of Technology was established with four engineering programs leading to the degrees of Chemical Engineer, Civil Engineer, Electrical Engineer, and Mechanical Engineer, as well as the degree of Bachelor of Science in Engineering. After 1936, the latter degrees were replaced by the degrees of Bachelor of Chemical Engineering, Bachelor of Civil Engineering, Bachelor of Electrical Engineering, and Bachelor of Mechanical Engineering. Beginning September 1968, The GSOE began offering a four-year curriculum leading to a Bachelor of Science degree in Computer Science. The Biomedical Engineering program was approved in 1999.

Since September 1963, under the auspices of the Graduate Center of CUNY, the GSOE began offering advanced study leading to the degree of Doctor of Philosophy in Chemical, Civil, Electrical and Mechanical Engineering and starting in 1969 a Master of Science degree in Computer Science was offered.

In recent years, the following programs have been approved: Master of Science in Biomedical Engineering (September 1999), Master of Engineering in Biomedical Engineering (September 2000), Bachelor of Engineering in Computer Engineering (September 2001), Bachelor of Engineering in Biomedical Engineering (September 2002), Bachelor of Engineering in Earth System Science and Environmental Engineering (September 2006), and a Master of Science in Sustainability in the Urban Environment (September 2009.) Beginning fall 2008, the City College of New York (CCNY) became a Ph.D. granting institution offering the Doctor of Philosophy degree (M.Phil./Ph.D.) in Biomedical, Chemical, Civil, Electrical, and Mechanical Engineering. Through the CUNY Graduate Center, a Doctor of Philosophy in Computer Science is also available.

In 1936, the Engineers Council for Professional Development (a predecessor organization of ABET) began a program of engineering accreditation. City College programs in Chemical, Civil, Electrical and Mechanical Engineering were accredited that same year. In 1992, the Computer Science program was CSAB accredited. In 2004, the Computer Engineering program was ABET accredited.

Grove School of Engineering Mission

The mission of the Grove School of Engineering is:

I. To be a School of national preeminence among public schools of engineering and computer science recognized for the excellence of its instructional and research programs;

II. To provide readily accessible, quality undergraduate and graduate education in a broad range of fields to a highly diverse student body, including traditionally underrepresented minorities and women, working adults, and immigrants;

III. To maintain and expand the program of fundamental and applied research in areas of national interest, particularly in technologies with relevance to New York City, its metropolitan region and New York State;

IV. To provide public service and continuing professional education opportunities to New York City and State, the local community in which the institution resides, the engineering and computer science professions, and society at large.

Grove School of Engineering Goals

The goals of the Grove School of Engineering are to:

1. Attract and maintain a world class faculty devoted to the synergistic activities of teaching and research;
2. Increase the competitive position of the School for attracting high achieving students;
3. Educate students to achieve the outcomes set forth by each program;
4. Continuously enhance the quality and technological relevance of graduate education and research programs;
5. Implement appropriate instructional delivery and support systems that facilitate access for a highly diverse student body;
6. Encourage multi-disciplinary approaches to both teaching and research in keeping with current technological progress in today's world;

7. Develop partnerships with industry, government, and other external organizations that will enhance the School's educational and research activities;
8. Attract the external resources necessary to support cutting-edge research;
9. Offer support in the preparation of K-14 students to enter engineering and computer science majors; and
10. Provide continuing education, technological expertise and public service to the engineering and computer science professions, the local community, and the city and state and governments.

D. Student Body

The Grove School of Engineering (GSOE) is one of seven schools and divisions at City College and is the College's second largest academic unit. With 2167 undergraduate engineering students, this represents 16.5% of CCNY's total undergraduate enrollment. The GSOE has 428 Master's students, the third largest enrollment at this level at the College. As of Fall 2012 there were 203 doctoral students in Engineering: (25 under the CUNY Graduate Center, and 178 at City College). In Computer Science, there were 23 students at the CUNY Graduate Center.

As of Fall 2012, women comprised 17.7% of undergraduate engineering majors and 23,1% of graduate engineering majors (USA citizens and permanent residents only). Among undergraduate engineering students in Fall 2012, 35.5% were Asian, 18.1% were Hispanic, 12.4% were Black, 17.8% were White, and 16.2% were nonresident Aliens. The demographic breakdown percentages for graduate engineering students included 17.5% Asians, 24.1% White, 13.0% Hispanic, 10.4% Black, and 35.0% nonresident Aliens.

Student Accomplishments 2011-2012

City College's Engineering students have always been well represented among the recipients of prestigious awards and participants in rigorous competitions in which they often place highly. They perform and publish original research, contribute to student life and society, and mentor younger students and often continue on to graduate studies in well regarded institutions. Grove students are generally a well-rounded, diverse and creative group who set high expectations for themselves and work diligently to achieve their goals. A number of recent accomplishments of undergraduate and graduate students are presented below.

Johnson Shiuan-Jiun Ho (Biomedical Engineering) was selected as the 2012 Valedictorian of the Grove School of Engineering. His achievements include the design of a new electrode technology for non-invasive electrotherapy, which has been published and patented and is in investigational use at major clinical centers. In mid-August, Johnson entered the MD/PhD program at SUNY Downstate Medical Center College of Medicine, where he is pursuing his interest in Neural and Behavioral Science. "I consider Johnson's most unique trait his passion for applying engineering to solve medical problems, with the very specific goal of healing. Johnson is not just a gifted biomedical engineering student; he is humanitarian to the core," says his advisor Dr. Bikson.

In 2011, the first Kaylie Prize for Entrepreneurship led to a burst of creativity among CCNY engineering and science students, as they rose to the challenge of generating ideas and translating them into marketable products. Harvey Kaylie '60 EE had endowed the competition with a $3 million gift.A team made up of computer engineering seniors Daniel Zuleta, Frank Palmer, Cindy Rodriguez and Javier Montesino, and psychology graduate student, Lei Ai, won the 2012 Kaylie competition. They

received a $50,000 cash prize from Harvey Kaylie ’60 EE, to help translate their prototype called VISTA (Vibro Tactile Intelligent System for Travelling Aid), into a marketable product.

Graduate students Elliot Schrock, Jeff LeBlanc, and Franqueli Mendez and undergraduates Johnny Huang and Crae Sosa of the team, “Julintani,” won the $12,000 Dean’s Prize for their development of a cellphone microdonation app for alumni.

Adam Atia (Environmental Engineering and Earth System Science) has participated in the Trans-Atlantic Aerosol & Ocean Science Expedition (AEROSE-V), in which he traveled across the Atlantic Ocean aboard a NOAA vessel to characterize the evolution of trans-Atlantic Saharan dust aerosols. Under the auspices of the DAAD German Academic Exchange Service, he has done research at the Leibniz Institute of Marine Sciences at the University of Kiel, in Germany, performing trace metal analysis to estimate residence times of dissolved aluminum concentrations in sea water after desert dust deposition. And most recently, for his capstone design project, he has engaged in the design, planning, and deployment of a hydro-climatic sensor network transecting the Neyba mountain range, north of Lake Enriquillo in the Dominican Republic.

Michael Cheng (Electrical Engineering) has done research in the Physics Department at Brooklyn College, at the Dartmouth College Center for Nanomaterials Research, and in the Grove School Chemical Engineering Department, where his three-year project focused on enhancing current distribution uniformity in electrochemical systems. During an internship at General Electric Transportation, he worked on the development of Tier 3 and Tier 4 locomotives. This confirmed his desire to go into industry. “I enjoyed being involved in innovative projects which yielded practical results,” he says. Michael established the first chapter of the American Society of Engineering Education on campus, and gained teaching experience by leading engineering workshops for summer campers in the Thayer School of Engineering Science Program. Under Macaulay Honors College auspices, he spent a semester studying in Barcelona, Spain.

In the 2011 Supermileage Competition, the CCNY team led by Glen Kleinsasser (Mechanical Engineering) placed 5th in design out of 32 engineering schools. Next, came the 2012 SAE Baja Competition in Alabama. “Although we have a small and relatively inexperienced team,” Glen said, “we have come up with a very innovative design that will hopefully translate into a much higher placement than past CCNY vehicles.” The team finished 21st overall out of 100 teams, up from 50th the last time CCNY competed, and 18th in the main endurance event.

Brigitte Liu (Computer Science) took part in the prestigious NSF REU MERIT Biosystems Internships for Engineers program at the University of Maryland. There, she implemented a biometrics recognition/verification system using face as modality and analyzed the performance of different security methods ranging from cryptography to signal processing, based on communication bandwidths, runtime, and matching accuracy. With her eye on homeland security, Brigitte has developed a working knowledge of five foreign languages which are critical to the Department of Defense.

Arash Nowbahar is (Chemical Engineering) has a 4.0 average. He likes his research to be “math intensive.” He is heading to UC Santa Barbara for his PhD, where he plans to do fundamental research in complex fluids and transport phenomena. At City, he acquired a broad ChE background and did research with Dr. Raymond Tu, in which he characterized and controlled fractal structures with applications in electronics. He also studied with Dr. Jeffrey Morris of the Levich Institute, the principal investigator of NSF PREM (Partnership for Research and Education in Materials) at CCNY, a collaboration with the University of Chicago MRSEC (Materials Research Science & Engineering Center). Under PREM auspices, Arash spent a summer in Chicago, analyzing the propagation of elastic-flexural vibrations on an ice shelf containing a random distribution of crevasses. Arash has also been an explainer at the New York Hall of Science. This convinced him that he would like to combine teaching with his research career.

For the past two years, Cynthia Wang (Civil Engineering) has been president of the GSOE's Concrete Canoe Club. In 2011, under her leadership, the Grove School placed first in the ASCE Metropolitan Region Concrete Canoe Competition. A member of the CCNY Honors Program, Cynthia excels in her courses and still finds time to volunteer for Habitat for Humanity. "Engineers should have an understanding of construction means and methods," she says, "so that they can make designs efficient and economical." As to the future, Cynthia intends to work in structural engineering before going on to her master's.

Daniel Zegel (Computer Engineering) has worked with another student to design a teaching tool that helps students understand the behavior of filters. He has also participated in a workshop on computational modeling and analysis of complex systems in which he was part of a three-person team that worked to model the first activation probability time distribution of a protein complex in the signaling pathway of a cancer cell. "I brought my knowledge of computer engineering to the team, and the other two members contributed their expertise in math and biology. It was an interdisciplinary effort that I found very rewarding," he says. Daniel is continuing his study of Talmud that he started in Israel, and he has tutored at the College's Accessibility Center, assisting a handicapped student in learning calculus.

Four Grove School students received a prestigious NSF Graduate Research Fellowship in 2012, out of 16 students CUNY-wide:

In Columbia University's Neurotrauma & Repair Laboratory, Christopher Hue '08 is continuing work in biomedical engineering in which he excelled at City. His GSOE education included collaborative work with surgeons at Memorial Sloan-Kettering Cancer Center.

Charles Corredor's doctoral work at the University of Washington in Seatle involves applications of micro and nano scale transport physics at the interface of chemistry, materials, and biology. He is studying nanotoxicity, i.e., how engineered nanomaterials can cause disruption of, and passive transport through, simplified models of artificial cell membranes. As a chemical engineering undergraduate, Charles did research at CUNY's prestigious Energy Institute and its Center for Analysis of Structures and Interfaces (CASI).

Stephen Ma '11 is a doctoral student in chemical engineering at the University of Delaware, where he is currently designing better pressure sensitive adhesives (PSAs), using covalent adaptable networks (CANs). PSAs stick to a surface with the application of pressure and are used in products such as sticky notes and paint tape. "My research at City gave me excellent techniques, and taught me how to pick up new material quickly," he says, "and the summer research I did in China, thanks to Dr. Lombardi, developed the skills which I am using in my doctoral project."

Jaeseung Hahn '12 is pursuing his doctorate in Harvard and MIT's joint program in medical engineering and medical physics. His goal is to develop a new type of branched gold nanoparticle for use in cancer detection and treatment. Jaeseung started research as a freshman with the encouragement of Dr. Yuying Gosser. He began his work on gold nanoparticles as a summer research intern in Germany, and continued it at Memorial Sloan-Kettering Cancer Center and in the Grove School lab of Dr. Sihong Wang.

Other high achieving graduate students are:

Joseph Badami (Chemical Engineering), who thanks to the wide network of colleagues of Grove's Dr. Raymond Tu, is working under Dr. Mark Borden of Columbia University, a leader in the field of interfacial science.

Mohammed Benalla (Biomedical Engineering), whose research will lead to a greater understanding of how to treat osteoporosis, prevent bone loss in long-term manned spaceflights and how to design better

prostheses. During much of his time at CCNY, Mohammed has been an adjunct professor at Citytech, teaching Fluid Power, Engineering Design, Statics, and Strength of Materials.

Samleo Joseph (Electrical Engineering) is part of a group of professors and students, led by Drs. Jizhong Xiao and Ying-Li Tian, who are perfecting a system to help visually challenged and blind people navigate interior and outdoor spaces. He is leading a team of students from a variety of engineering majors who are engaged in developing the software algorithms and the hardware, which includes audio and tactile feedback, to make products to help the blind less expensive, more comfortable and more accurate.

Lauren Patrin (Mechanical Engineering) has already published two papers under the guidance of professor Feridun Delale, on research to develop lighter weight armor for military vehicles. Her research will provide valuable knowledge to make commercial vehicles lighter and more affordable, cutting down on fuel consumption. After her doctorate, Lauren is headed for the transportation industry, where she plans to use her knowledge of composites in the manufacturing of planes, trains or cars.

Irripuge Milinda Perrera (Computer Science) is doing doctoral research with Dr. Nelly Fazio in the area of Anonymous Broadcast Encryption. In a paper presented at PKC 2012, the 15th IACR International Conference on Practice and Theory of Public-Key Cryptography in Darmstadt, Germany, Milinda and Dr. Fazio proposed the first broadcast encryption scheme with sublinear ciphertexts to attain meaningful guarantees of receiver anonymity.

(add recent CHE student accomplishments).

Recent History of the Grove School's Admissions Requirement

The City College of New York (CCNY) Mission Statement states in part:

"City College's mission emphasizes access and excellence in undergraduate and graduate education and research. Requiring demonstrated potential for admission and a high level of accomplishment for graduation, the college provides a diverse student body with exceptional opportunities in creative intellectual pursuits."

The Grove School of Engineering values the City College's mission with its emphasis on access and excellence. However, access is meaningful only if the ultimate goal of graduation is attainable for the student. It is imperative that our newly entered students be properly prepared in order to reap the full benefits of a quality education. To ensure that students are prepared for success, we studied the academic background and demographics of our engineering students that best determined long-term retention and graduation rates. We found that retention of transfer students was best predicted by: 1) the number of math and science credits transferred, and 2) the grade point average at the previous school. For the retention of freshmen, we found that the best predictors were: 1) the math level of students entering engineering, and 2) the student's gender (female students were retained at a higher level compared to male students). Based on this data and other historical data related to student retention at the City College, the GSOE decided to change its admission criteria in fall of 2005.

For entering freshmen, previously an admissions index that considered numerous academic parameters, such as the student's College Admissions Average (CAA), SAT (Scholastics Aptitude Test) scores and when applicable, TOEFL scores, were used to determine admission to the Grove School. If a student received an index number over a certain minimum score they were admitted. In fall 2006, a new

criterion was included for admission into the GSOE for entering freshmen. In addition to a minimum index score, placement in pre-calculus or higher was required. For transfer students, the new criteria required the completion of Calculus I with a C or higher, an overall GPA of 2.50 or higher, and demonstrated proficiency in mathematics and science. Since 2006, admissions requirements for entering freshmen have increased slightly over several years, with careful monitoring of the impact of the change on enrollment and the demographics of the entering class. A summary of the progression of new/additional admissions requirements for new freshmen in the Grove School is as follows:

2006: Students must satisfy the index requirement and place into pre-calculus or higher.
2008: Students must have the appropriate high school average, SAT score, units of math and science courses as shown in the table below.

GSOE Fall 2008 Admissions Requirements			
HS average	Min SAT	English units (or min SAT 500)	Math units (or min SAT 550)
78	900	2	3
75	950	2	3
90	700	2	3

2009: Students must have the appropriate high school average, SAT score, units of math and science courses as shown in the table below,

GSOE Fall 2009 Admissions Requirements				
HS average	Min SAT	English units (or min SAT 500)	Math units (or min SAT 550)	Science Units
< 85	1000	2	3 and math avg >= 80	3 (includes Chem or Phys)
>= 85		2	3 and math avg >= 80	3 (includes Chem or Phys)

2010: Freshman students applied directly to the Grove School for fall 2010 admissions and were admitted based on the fall 2009 admissions requirements.

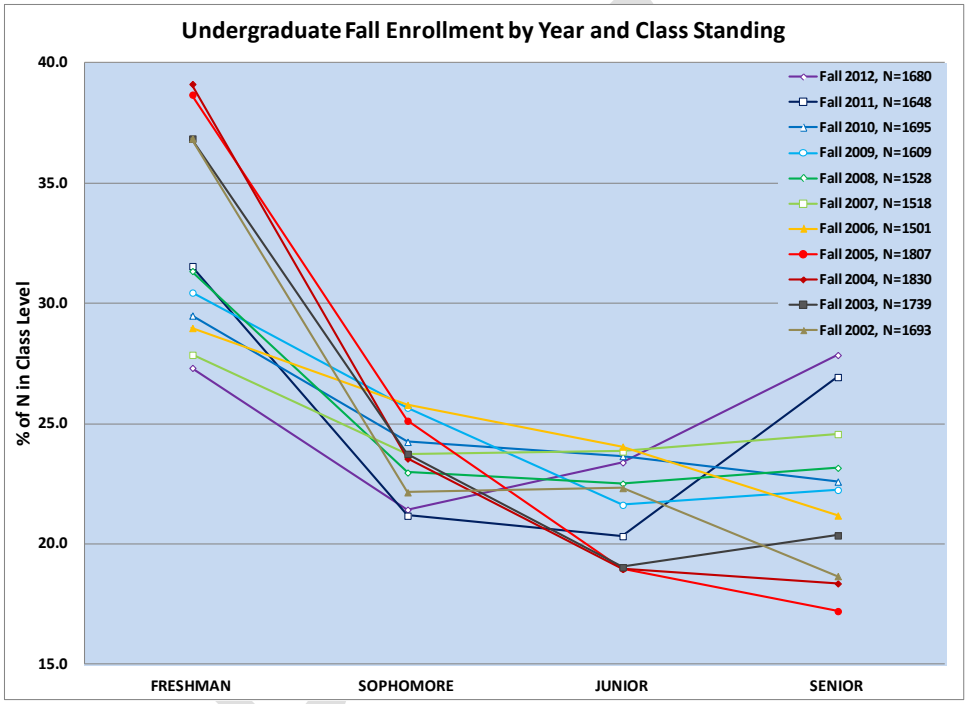
Comment [AA1]: add admissions criteria 2011, 2012

The impact on undergraduate enrollment is shown in the table below where we can see a more even distribution of students with respect to their academic level in 2009 in comparison with the distribution in 2002.

Full-time Fall Undergraduate Enrollment by Year and Class Standing				
Year: Part-Time	Freshman	Sophomore	Junior	Senior
2002: PT=415	624	375	378	316
2003: PT=521	641	413	331	354
2004: PT=541	716	431	347	336
2005: PT=530	699	454	343	311
2006: PT=443	435	387	361	318
2007: PT=405	423	360	362	373

2008: PT=383	479	351	344	354
2009: PT=416	490	413	348	358
2010: PT=436	500	411	401	383
2011: PT=558	520	349	335	444
2012: PT=487	459	360	393	468

A more striking illustration of this evening out effect can be seen in the graph below.



The percentage increase in juniors and seniors in the context of a growing overall enrollment since the implementation of new admissions criteria in Fall 2006, indicates that retention has improved. This is a positive development, but it also implies a growing demand for the discipline specific courses offered by the Grove School of Engineering, since most discipline specific courses in the engineering curriculum are offered in the senior and junior years. This causes considerable pressure on resources and personnel, exacerbated by the college's recent budget deficits and the challenges in funding the PhD programs in Engineering.

The increase in the retention rates of "First – Time, Full – Time" regular students is shown in the next table The six year graduation+retention rate improved with 10% for the first cohort (fall 2006) under the new admissions criteria. Later cohorts show greatly improved retention rates after 4 and 6 semesters. The

retention rates in Engineering are (still) lower than the college retention rates, but they do not negatively impact these rates since many students who leave engineering move to another major at CCNY and graduate. Including this group would show higher retention rates than for the college overall. Based on further studies, the School is now considering to reserve freshmen matriculation in Engineering to those who are ready to take Calculus 1 or higher level math.

First-Time, Full-Time Retention Rates of Regular Engineering Students Entering as Freshmen (% of N returning or graduated after n semesters)						
Cohort (# Students)	**2 semesters**	**4 semesters**	**6 semesters**	**8 semesters***	**10 semesters***	**12 semesters***
Fall 2005 (N=316)	66	45	33	28 (3)	26 (17)	26 (21)
Fall 2006 (N=177)	73	58	47	40 (7)	40 (21)	36 (27)
Fall 2007 (N=260)	77	57	48	39 (9)	35 (24)	
Fall 2008 (N=279)	79	58	46	43 (6)		
Fall 2009 (N=307)	77	62	55			
Fall 2010 (N=299)	85	64				
Fall 2011 (N=262)	80					

* Total percentage retained plus graduated before. % Graduated in parentheses.

E. Regional or Institutional Accreditation

The City College of new York is accredited by the Middle States Association of Colleges and Secondary Schools to award Bachelors, Masters and Doctoral degrees. Accreditation was first granted in 1921 and has continued without interruption. The most recent renewal of accreditation to the College was granted by Middle States in 2008. The City College is also accredited by the New York State Department of Education, and by the Association of American Universities.

F. Personnel and Policies

1. **Promotion and Tenure System**

The general standards and qualifications for promotion in the professorial titles and for tenure can be found in the CUNY Bylaws. Criteria used in the professional evaluation of faculty are contained in the collective bargaining agreement between CUNY and the Professional Staff Congress (PSC), the union

representing faculty. These policies are quite general and have been supplemented at CCNY by extensive guidelines reflecting broad consideration of teaching, research and professional service. The materials submitted for evaluation of candidates include a curriculum vitae, peer and student evaluations of teaching and letters of external reference.
The tenure system provides for the following:

a) Appointments of non-tenured faculty are on an annual basis. Recommendations for reappointment or non-reappointment are initiated by the department's Executive Committee.
b) For persons serving in the professional ranks, tenure, if approved, is granted with the sixth reappointment.
c) For persons promoted to the rank of Professor, tenure, if approved, is granted after four years of faculty service.

On matters of promotion and tenure, the process flows from the department Promotions Committee in the case of promotions, to the departmental Executive Committee in the case of tenure to the GSOE Personnel and Budget (P&B) Committee, to the Deans and Provost sitting as voting members of the CCNY Review Committee, to the President. The Department Chairperson provides a written evaluation for the candidate's dossier and makes an oral presentation on the candidate to the P&B Committee. The Dean makes an oral presentation to the Review Committee. Reappointment is an annual course of action with decisions following the same process as hiring with a recommendation originating with the departmental Executive Committee.

The review process under (b) above is awarded in fall of the sixth academic year of employment by the departmental Executive Committee (the process under (c) above is begun earlier, if applicable). If the vote is positive, the Departmental Chairperson forwards the matter with an evaluation of the candidate to the GSOE Personnel and Budget (P&B) Committee. The GSOE P&B Committee consists of the Dean (presides), Associate and Assistant Deans and Department Chairpersons. Only Department Chairpersons have vote. If the P&B votes favorably, the matter is then forwarded to the College wide Personnel and Budget Committee known as the College Review Committee (CRC). The CRC is comprised of the Provost (presides), Vice Presidents, full Deans, Chairs of The Faculty Senate and Faculty Committee on Personnel Matters, Chief Librarian and Director of the SEEK Program (higher education opportunity program for economically and educationally disadvantaged students.) For faculty personnel deliberations, the College Review Committee consists of the Provost (as Chair) and the full Deans, all with vote, as well as the Chairs of the Faculty Senate and College Committee on Personnel Matters, without vote. The Deans present and discuss the candidates from their respective units. The Review Committee then votes on the candidates and forwards their favorable decisions to the President. The President then forwards his/her recommended candidates to CUNY's central administration for ultimate final approval by the CUNY Board of Trustees.

Comment [MSOffice2]: Update necessary?

Appeal of a denial of tenure can be made by the candidate at any stage of the evaluation process at the College.

The promotion and early tenure system is similar to the tenure process described above, but involves an early screening of all eligible faculty in the department. Early tenure is granted only in extraordinary circumstances. Promotion to Associate Professor and tenure can be considered concurrently at the discretion of the department.

2. **Determining Faculty Salaries**

Faculty salary schedules are determined through collective bargaining negotiation with the Professional Staff Congress (PSC)-CUNY faculty union, the CUNY and the State. Annual advancement within salary schedule is normally automatic. Upon recommendation by the President, the Board of Trustees grants additional increments within schedule for exceptionally meritorious faculty. Table D - 6 (page Appendix D - 54) shows faculty salary data of the College as a whole, the GSOE, and the Departments.

The Department Chairperson is required to observe the teaching skills and practices of all non-tenured members of the instructional staff by means of announced, periodic observation visits to the classrooms of the individuals concerned. The tenured members of the faculty, who send their reports to the chairperson, normally make these visits each semester. On the basis of these reports, along with student evaluations and the record of teaching, research and service, an evaluation conference with each non-tenured faculty member is held by the Chairperson and is documented with a written conference summary. The Dean and the Review Committee review the evaluation before writing letters of reappointment.

3. **Faculty Benefits**

Faculty benefits are provided through the benefit programs of the PSC. These include retirement benefits under which faculty select either the New York City Teachers retirement system or the TIAA/CREF Retirement Program. Health insurance coverage is provided by the City of New Employee Health Benefits Program. Disability, dental, optical and group life insurance are available as well.

At CCNY, the fellowship (sabbatical) leave program provides full-year (at 80% pay) leaves after every six years of continuous service. Faculty are encouraged to avail themselves of these leave opportunities and unpaid leaves, where another institution or government agency will host them and pay their full salary. On average, 8-9% of faculty is on leave at any given time.

Consulting or other outside employment activities that strengthen professional competence are encouraged, provided they do not exceed one day a week. Disclosure of such activities is required and the activities are subject to approval by the departmental Executive Committee, the Department Chairperson and the Dean (acting for the President).

Faculty participation in externally funded research is encouraged and expected. The usual practice is for the College to provide at least a 50% cost-sharing match toward released time during the academic year. The maximum additional compensation from grant-funded summer salary is one-third of the academic-year salary.

Comment [AA3]: Update needed?

G. Educational Unit

Regarding the College's reporting structure, each Department Chair reports to the Dean of Engineering. The Dean of Engineering reports to the Provost and Senior Vice President of The City College. The Provost reports to the President of City College. The President of City College reports to the Chancellor of the City University of New York.

As shown in the GSOE organizational chart (Table I), there are six academic departments, with corresponding academic programs and two jointly administered (JA) programs in the School:

Biomedical Engineering	Electrical Engineering
Chemical Engineering	Mechanical Engineering
Civil Engineering	Computer Science
Computer Engineering (JA)	Earth System & Environmental Engineering (JA)

The Department of Electrical Engineering and the Department of Computer Science jointly administer the undergraduate program in computer engineering. The Grove School of Engineering and the Division of Science jointly administer the undergraduate program in Earth System Science and Environmental Engineering.

The Ph.D. programs in the GSOE are administered at the City College. The administrative head of these programs is the Associate Dean for Graduate Studies in the GSOE.

Administration of the School (including key staff members)

Dean of Engineering	Dr. Joseph Barba
Associate Dean, Office of Graduate Studies (acting)	Dr. Ardie Walser
Assistant Dean, Office of Undergraduate Academic Affairs (acting)	Dr. Laurent Mars
Deputy to the Dean	Ms. Leslie Galman
Director, Office of Assessment & Institutional Studies (OASIS)	Dr. Annita Alting
Senior Administrative Officer, Facilities Management	Dr. Fred Brodzinski
Chair, Biomedical Engineering	Dr. John Tarbell
Chair, Chemical Engineering	Dr. Jeffrey Morris
Chair, Civil Engineering	Dr. Julio Davalos
Chair, Computer Science	Dr. Douglas Troeger
Chair, Electrical Engineering	Dr. Roger Dorsinville
Chair, Mechanical Engineering	Dr. Feridun Delale
Director, Earth System Science & Environmental Engineering	Dr. Fred Moshary
Administrative Director, Computer Engineering	Dr. Sam Fenster
Director, Benjamin Levich Institute for Physiochemical Hydrodynamics	Dr. Morton Denn
Director, NY Center for Biomedical Engineering	Dr. Mitchell B. Schaffler
Director, CUNY Env. Science and Engineering (ENSE) Institute	Dr. Samir Ahmed
Director, Center for Water Resources and Environmental Research	Dr. Reza Khanbilvardi
Director, Institute of Transportation Systems	Dr. Neville Parker
Director, Center for Networking and Telecommunications	Dr. Tarek Sadaawi
Director, Energy Institute	Dr. Sanjoy Banerjee
Director, Center for Algorithms and Interactive Scientific Software	Dr. Rosario Gennaro
Director, CUNY Institute of Urban Systems	Dr. Robert Paaswell
Director, Institute for Ultrafast Spectroscopy and Lasers	Dr. Robert Alfano
Director, Center for Analysis of Structures and Interfaces	Dr. Daniel Akins
Director, Center for Advanced Technology	Dr. David Crouse
Director, Office of Student Development	Mr. Rawlins Beharry
Director, Office of Student Research & Scholarship	Dr. Yuying Gosser
Administrative Director, Biomedical Engineering	Dr. Phillip Payton
ABET specialist and Administrative Coord., Chemical Engineering	Mr. Nicholas Cromie
ABET Specialist and Educational Advisor, Electrical Engineering	Mr. Edward Baurin

Senior Administrative Director, ABET Specialist, Computer Science	Dr. Edward Camp
Administrative Director, Earth System Science and Env. Engineering	vacancy
ABET Specialist for CE/ME/ESE; Coord. Joint/Dual Degree Programs	Dr. Meg Krudysz
Upper Level Academic Advisor, Office of Academic Affairs	Ms. Debbie Moore
Upper Level Academic Advisor, Office of Academic Affairs	Dr. Gulam Mustafa
Freshmen Academic Advisor (GSOE funded), Office of Student Devt.	Ms. Lauren Shuman
Computer System Manager, GSOE	Dr. Shaoquan Lin
Accounting Assistant, Dean's Office	Ms. Yvette Forehand
Administrative Assistant, Dean's Office	Ms. Detra Mack-Mitchell
Administrative Assistant, Dean's Office	Ms. Margaret Diaz

Engineering Leadership Council Members, 2011-2012

Aziz Ahmad CEO UTC Associates, Inc.	Milovan Blair Vice President, Systems and Transmission Operations Con Edison	Paul V. DeLuca Chairman Telecom Consultants
Jacob Feinstein Vice President (Retired) Con Edison	Ronald A. Gottlieb Consultant (Retired) Skanska	Rich Hohlman Vice President National Grid
Harvey Kaylie President & CEO Mini-Circuits	Ira Levy Senior Vice President AECOM	Jeffrey M. Levy President & CEO RailWorks Corporation
Norman A. Nadel Chairman (Retired) Nadel Associates	Michael Pope President & CEO, Robbins, Pope & Griffis	Ronald Rosenzweig Chairman Anadigics
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I. Research Centers and Institutes

- Benjamin Levich Institute for Physicochemical Hydrodynamics,
- NY Center for Biomedical Engineering (NYCBE),
- CUNY Environmental Science and Engineering (ENSE) Institute,
- Center for Water Resources and Environmental Research
- CUNY Institute for Transportation Systems (ITS),
- Center for Information Networking and Telecommunications (CINT),
- Energy Institute,
- CUNY Institute of Urban Systems (CIUS),
- Institute for Ultrafast Spectroscopy and Lasers,
- The Center for Algorithms and Interactive Scientific Software (CAISS).

In addition, GSOE faculty participate in the administration and research activities of two research centers housed in the Science Division, the Institute for Ultrafast Spectroscopy and Lasers and the Center for the Analysis of Structures and Interfaces. What follows is a brief synopsis of these centers and institutes.

The Benjamin Levich Institute for Physicochemical Hydrodynamics is an internationally reputed research institute for the study of fundamental problems of flow and transport in complex fluid, fluid-like media and interface systems. It has involvement of faculty researchers from Chemical Engineering, and Mechanical Engineering as well as a few from Physics in the Division of Sciences. In addition, there are normally a number of visitors, postdoctoral research associates and Ph.D. students. With the Institute's excellent laboratory and computational facilities, their current scope of research is: granular flow, low Reynolds number hydrodynamics, non-Newtonian fluid mechanics, computational fluid mechanics, and transport along interface. The Institute has an independent research and staff budget provided by the College and substantial external research funding.

The New York Center for Biomedical Engineering (NYCBE) is a research unit established in 1994. The Center has involvement of faculty researchers from Biomedical, Chemical, Electrical, and Mechanical Engineering, as well as from the Department of Biology in the Division of Sciences. The Center operates in partnership with several prominent New York City biomedical research organizations and hospitals. Up until the formation of the Department of Biomedical Engineering and initiation of a stand-alone baccalaureate program in biomedical engineering, the Center coordinated the offering of undergraduate concentrations in biomedical engineering in all engineering programs in the School and operated interdisciplinary MS, and Ph.D. programs. Many of the biomedical engineering undergraduate and graduate students are involved as researchers with the Center or with its partner institutions. The Institute has substantial external funding from government agencies and private foundations. It also has an administrative staff budget provided by the College.

The Environmental Science and Engineering Institute (ESEI) established in 2008, has focused its initial activities on remote sensing of the environment, an area where CUNY's research has become increasingly multidisciplinary and collaborative. ESEI provides an effective and existing multi-disciplinary platform for fostering CUNY wide interactions and collaborations between science and engineering disciplines which can leverage, capitalize and exploit the strength of CUNY research in

these areas, which has achieved increasingly widespread international recognition. Much of this research strength, in particular the multi-disciplinary team approach which environmental research mandates, was initially built up on long term funding from NOAA and NASA. The collaborations and scope of activities have now greatly expanded. They continue to exploit CUNY strengths in environmental remote sensing, with work on the atmospheric, oceanic and terrestrial environments, and anthropogenic, climate, weather and pollution impacts on these, in conjunction with Local, State and other Federal agencies, including EPA, DOD and NSF (and continuing with NOAA and NASA) as well as collaborations with other universities and international agencies.

The Center for Water Resources and Environmental Research (CWRER) conducts research on a considerable variety of topics in the water resources/environmental area including natural hazards, pollution movement, surface water and groundwater cleanup, wetland preservation, reservoir protection, watershed management, the hydraulics and hydrology of natural flow systems, non-point source pollution, ecology preservation, and other related subjects. Both the technical and sociopolitical issues arising from these studies are addressed. The Center offers regular research seminars on water resources, environmental engineering, and environmental ecology. The research, educational, and training programs are being carried out in close cooperation with the city, state, and federal agencies responsible for overseeing the nation's water and environmental resources as well as non-governmental organizations representing the public interest.

The CUNY Institute for Transportation Systems (ITS) is comprised primarily of faculty from the Civil Engineering, and Computer Science. The Institute is the lead organization in the federally funded **University Transportation Research Center**, which involves ten other universities. Research is being conducted in a wide range of transportation areas, including road systems, public transportation and multi-modal systems. The Department of Civil Engineering offers transportation concentrations at the undergraduate and doctoral programs and a distinctive Master's program in Transportation. ITS has a separate College budget for administration.

Center for Information Networking and Telecommunications (CINT) focuses on research and development in the fields of high-speed, multi-media, multi-service, integrated wired/wireless networks, mobility in IP and ATM networks, secure communications, and information distribution networks. We also offer courses and labs in these areas to train undergraduate and graduate students to be the leaders of this information era. These research and educational activities have been funded by government agencies and industries including: US Army, National Science Foundation, Telcordia (formerly Bellcore), Panasonic, NY State, NY Department of Transportation, and AT&T.

The Energy Institute was formed in 2008 to consider new approaches to large-scale energy production and storage. It serves and comprises of researchers from all campuses of the City University of New York, with a mission to create, evaluate, and provide a seed for the implementation of advanced energy technologies. These technologies would provide low cost, sustainable energy solutions tailored for the various environs that make up New York State, from preserving the serenity of the Adirondack region to meeting challenges of powering New York City. The Energy Institute takes a comprehensive approach to this problem, combining fundamental studies of emission-free energy production and energy storage through new materials and mechanisms.

CUNY Institute for Urban Systems (CIUS) is a multi-campus CUNY institute that investigates urban infrastructure using themes of new technology, infrastructure, institutions and finance. The

Institute combines engineering and social science research in addressing major problems in urban areas.

The Institute for Ultrafast Spectroscopy and Lasers is a research unit that also houses the New York State Center for Ultrafast Photonic Materials and Applications. This interdisciplinary Institute is housed in the Science Division but one component of the Institute, the Photonics Application Laboratory, is housed within the GSOE. Research is in the areas of ultrafast phenomena, new laser sources, nonlinear optics, imaging, optical communication, optical storage, optical remote sensing and microstructures. A large number of engineering undergraduates and graduate students are involved in Institute research projects. The Institute has an independent research budget from the College.

Center for Analysis of Structures and Interfaces (CASI) involves materials science researchers in the GSOE and in the Science Division. One of CASI's principal objectives is to increase the number of minority engineers and scientists trained to conduct high-level research. It provides undergraduate research experiences to many minority undergraduate engineering students. CASI receives administrative budgetary support from the College.

The Center for Algorithms and Interactive Scientific Software (CAISS) is a research center where mathematicians and computer scientists come together to collaborate on different projects. It grew out of work on a graphically driven, easy to use, software package called MAGNUS, designed to answer questions about and to carry out experiments with finitely presented groups. In addition, CAISS is developing new games or puzzles, based on group theory. CAISS also manages the New York Group Theory Cooperative, which organizes the NY Group Theory Seminar at the Graduate Center. The facilities of CAISS include a 132 node Beowulf cluster, which is being used for work in computational biology and group theory and a small computer lab equipped with CAISS developed software.

There are many strong multi-faculty research areas within the GSOE that are not yet separately organized. These include earthquake engineering in Civil Engineering, and image processing in Biomedical Engineering, Computer Sciences, and Electrical Engineering.

The CCNY Office of Research Administration encourages, develops budgets for and administers most regulatory aspects of research grants and contracts. It provides a local interface to the Research Foundation of CUNY, the fiscal custodian of all CUNY research grants.

II. Office of Student Development of the Grove School of Engineering

The Office of Student Development (OSD), previously identified as the Office of Student Programs (OSP) was re-structured to focus more on the provision of academic advising, academic monitoring and registration services to lower-division students (students with less than 45 credits). The OSD continues to provide critical academic support to freshmen and sophomores, and in many cases, to student at all levels. Programs and services provided through the Office for Student development are: the OSD are:

- Academic Advisement for students with less than 45 credits
- Academic Monitoring
- New Student Orientation
- Registration
- Probation/Dismissal Workshops
- Tutorial Services
- Counseling
- Career and Professional Development
- Cooperative Education and Internship Referral
- Undergraduate Research Referral
- Engineering Student Organizations and Clubs
- Women in Engineering Initiatives
- GSOE Student Surveys
- Freshmen Retention Data Collection and Analyses
- Pre-College Outreach
- Special GSOE Events

Working in collaboration with GSOE departments and key campus-wide offices and programs, efforts are made to ensure engineering students' academic, professional and career development, as well as leadership and community service. The Office also plays a major role in identifying recipients for top academic scholarships, undergraduate research experiences, internship opportunities, and the planning of strategic events to enhance faculty and student relationships and interactions. It serves as a "home base" to students where they can study and work together, learn about various opportunities, receive broad support, and informally interact in a supportive learning environment.

The OSD oversees engineering student societies, organizations and clubs to ensure close inter/intra collaboration to offer a wide range of academic, professional, social and other community-building activities throughout the academic year. These efforts also help to strengthen the School's student outreach and retention efforts.

The OSD helps to coordinate GSOE pre-college outreach events and activities. As part of the School's recruitment effort, the GSOE offers three Summer Programs for pre-college students that focus on boosting their interest in STEM fields and increasing proficiency in mathematics and science to better prepare for college STEM majors. Descriptions of these programs can be found in the Appendix.

III. Office of Academic Affairs of the Grove School of Engineering

The Office of Undergraduate Affairs (OUA) is the primary source in the Grove School of Engineering for information on issues concerning the school's academic policies, admissions, curriculum and graduation requirements.

One of the major roles of the OUA is the advisement of engineering and computer science students in conjunction with the OSD. The Grove School of Engineering (GSOE) organizational structure for advising is a modified Split Model, where the advising duties are split between two central offices (the OSD and OUA) with professional advisors and faculty members from the departments. Students who have earned 44 credits or less receive academic advisement from professional counselors through the OSD. Students with 45 credits or more are advised by a faculty member in their department, along with a professional counselor from the OUA.

The faculty member's strength as an advisor is in their experience as an educator and a professional in their area of expertise (e.g., electrical, civil, chemical engineering). They help the student make informed decisions in choosing a career path that suits their interest and talents. The professional counselor tends to be more versed in the policies and procedures of the college and they aid the student in avoiding costly mistakes that can either cost them additional money or delay their graduation or cause them to be dismissed all together.

The duties of the counselors in the OUA extend beyond advisement. They perform other important functions such as making sure that students have the proper requisites for courses, verifying that a graduating senior has fulfilled all degree requirements, as well as performing transfer credit evaluations for students from other academic institutions who wish to transfer to the GSOE.

A summary of the duties and the support services provided to students by the OUA are as follows:

1. Admissions
2. Advisement for students with 45 credits or more,
3. Academic Policies
4. Transfer Course Evaluation
5. Committee on Course and Standing
6. Curriculum Requirements
7. Graduation Certification
8. Management of Joint/Dual Degree Engineering Programs
9. Articulation Agreements
10. Probation & Dismissal

IV. Office of Student Research and Scholarship

It has been recognized that early exposure to science &engineering research has a profound impact on students' professional and career development. As such, the GSOE established the Student Research & Scholarship Center (SRSC) in 2008 to provide students early exposure to research experiences.

The mission of the SRSC is to work in close collaboration with GSOE faculty to promote student participation in research. Working also in collaboration with the OSD, the SRSC offers a research training program to prepare students, in particular freshmen, for their research experiences by having students actively participate in Center-sponsored activities and program, such as:

1. The Science and Engineering Communication Workshops, which started in academic year 2008- 2009, introduces faculty researchers to students to help them become more familiar

with faculty research fields. These workshops assists students with applying for internal and external research fellowships internships, as well as facilitates a better understanding of the process of presenting oral and poster presentations to showcase their research progress.

2. The Nationwide Genome Science Education program prepares students for newly emerged research fields, such as biomedical engineering, environmental engineering, bio-inspired material science, and other pertinent areas. This program was also offered to select high school students through the CUNY College Now program, a program to better prepare students to enter college as engineering, science, and other STEM-related majors.

3. Computer programming based on the "Art of Science and Engineering" program improves students' programming skills and data visualization capability, as well as communication skills. Students' creative STEM-themed artworks are showcased in the Annual Art of Science and Engineering Exhibition that has created a broad impact in the CCNY community.

4. Submissions to the *Journal of Student Research* to showcase students' research achievements and faculty mentoring efforts. In the 2009 edition of the Journal, 13 articles related to student and faculty research were selected for publication covering a broad range of research topic areas.

The SRSCS plays a critical role in promoting student research participation in an exciting academic environment, as well as enhancing the publicity of the GSOE as a premier research institution.

V. Cooperative Education Engineering

The Cooperative Education Engineering (COOP/ENG) Program is administered through the Office of Student Development (OSD). This is an optional program offered to engineering students that provides alternate semesters of academic study with semesters of full-time employment in engineering positions related to students' academic or career interests. Assignment locations are both local and national. Student participants in COOP/ENG can expect to benefit from the experience in several ways, including:

- Application of classroom knowledge to real-world experiences
- Enhancement of knowledge, capability, and leadership skills
- Expanded motivation and stimulation to continue academic studies
- Increased maturity, practicality, and responsibility
- Expanded job opportunities upon graduation.

To participate in the COOP/ENG program, students must have completed a minimum of 30 credits toward their degree and met required academic standards. Students must also submit a report on COOP/ENG progress and accomplishments for each work period.

It is important for students to note the following:

- In many cases, no academic credit is given for the COOP/ENG work experience.
- In order for a student to receive credit for the work experience as an independent study, a proposal for a specific project must be approved by a faculty mentor/advisor, the department chair, the Associate Dean and a manager/mentor at the company where the student will be working.
- Participation in this program normally extends the time needed to complete degree requirements.
- The type of COOP/ENG experience a student has is largely structured by the specific company/organization offering the program.
- Work periods are not just summer jobs, although the summer may be included in a fall or spring work assignment.

Most recent cooperative education employers have included governmental agencies such as NASA and Brookhaven Laboratories, large private corporations such as IBM and General Electric, and local agencies such as the MTA. Each year, a significant number of students participate in this effort

VI. Recent Faculty Accomplishments

Faculty Accomplishments 2011-present

GSOE Faculty obtained a record amount of grants, a number of which are listed below.

It has been a longstanding City College priority to increase the number of students who graduate in STEM disciplines. Now, a **$4 million grant from the US Department of Education** is giving that effort a big boost. Recognizing that retention of transfer students is a key issue and that many of these students come from CUNY's community colleges, the funds will be used to establish CILES (Alliance for Continuous Innovative Learning Environments in STEM) to enhance articulation in STEM between CCNY and Hostos and LaGuardia Community Colleges. Dr. Jorge Gonzalez, NOAA-CREST Professor of Mechanical Engineering, is spearheading the effort, which will be headquartered in the CUNY-CREST Institute. The CILES leadership includes co-PIs Dr. Yaseer Hassebo of LaGuardia, Dr. Nieve Anguo of Hostos, and Dr. Jeff Steiner of City, as well as Drs. Fred Moshary, Barry Gross, and Karin Block of NOAA-CREST.

NSF's prestigious CAREER award supports "early career development activities of those teacher-scholars who most effectively integrate research and education within the mission of their organization." Dr. Sihong Wang is receiving $400,000 over five years to perfect a device which has the potential to transform cancer drug screening and ensuing treatment. In addition to being a stellar researcher, Dr. Wang is a teacher and mentor of note. Her CAREER project will incorporate up-to-date biotechnologies into the CCNY BME curriculum and provide undergraduate research opportunities, which prepare students for BME careers. For high school students, research experiences will build scientific knowledge and encourage them to major in BME.

Associate Professor Debra Auguste (Biomedical Engineering) is a recent **NSF CAREER Award** winner (along with Sihong Wang). The award honors Auguste as one of the most promising up-and-coming researchers in her field and provides an **annual grant of $100,000** to support up to five years of laboratory research and educational outreach. The grant supports research on drug-delivery vehicles at the molecular level. Dr. Auguste also received in 2012 the very prestigious **NIH Director's New Innovator Award**, that supports exceptionally creative new investigators who propose highly innovative projects that have the potential for unusually high impact. Her project *"Personalized therapeutics for inhibiting breast cancer metastasis"*, was awarded **$2,295,000.**

Zhigang Zhu, Professor of Computer Science, YingLi Tian, Professor of Electrical Engineering, both at the Grove School, and Tony Ro, Professor of Psychology and Director of the CUNY Cognitive Neuroscience Doctoral Program, secured a **$2 million project, supported by the NSF Emerging Frontiers in Research and Innovation program**, on which they are collaborating with Kok-Meng Lee, Professor of Mechanical Engineering and Director of Georgia Tech's Advanced Intelligent Mechatronics Research Laboratory, and Boris Prilutsky, Associate Professor of Applied Physiology at Georgia Tech. The objective is to develop cost-effective mechatronic devices to assist visually impaired people in achieving mobility functions comparable to people with normal vision.

The CUNY Remote Sensing Earth System Institute (CUNYCREST), established in 2001, is now positioned to become the center of excellence for environmental remote sensing for the northeastern United States, funded from 2011 to 2016 by a **new $15 million grant from NOAA**. CREST research focuses on four themes: climate; weather and atmosphere; water resources and land processes; and ocean and coastal waters. According to Dr. Khanbilvardi, leader of NOAA-CREST: "Our research products are being used not only by NOAA, but by other agencies at the federal, state and local level, such as NASA and the EPA." NOAA-CREST's top-flight research goes hand-in-hand with its commitment to education. It has produced more than 500 graduates, 75 percent of whom are from groups underrepresented in the remote sensing sciences.

The Advanced Research Projects Agency - Energy (ARPA - E) has awarded the Energy Institute $4.6 million over three years to fund two projects which are revolutionizing energy storage. Through the first project, with $3 million in support, Dr. Banerjee is leading the development of a low-cost, grid-scale electrical storage system using a flow-assisted, rechargeable zinc-manganese oxide battery. Ultralife Corp. is a partner in the project. The second project, with $1.6 million in funding, is led by Associate Professor of Chemistry Stephen O'Brien. In conjunction with Columbia University and the University of California Berkeley, it aims to develop less expensive, more efficient, smaller, and longer-lasting power converters for energy-efficient LED lights.

At the Center for Information Networking and Telecommunications (CINT), Professor of Electrical Engineering Tarek Saadawi and his team perform critical research into multimedia, multiservice, integrated wired and wireless networks, sensor networks, and network security. The Center's work on telecommunications and information distribution has attracted **$2.5 million from the U.S. Army Research Laboratory (ARL).** In addition to its ground-breaking research, CINT has partnered with the Institute of Strategic Studies at the Army War College to organize the **2009, 2011 and 2012 Cyber Infrastructure Protection Conferences**, held at City College, and chaired by Dr. Saadawi and Colonel Louis Jordan of the Army War College's Strategic Studies Institute. Dr. Saadawi and Colonel Jordan have also served as **co-editors** of "Cyber Infrastructure Protection." Recently, Dr. Saadawi received a **National Science Foundation grant** to promote international cooperation in cyber security research between the US and Egypt. Under the grant, he will organize the first US-Egypt Workshop on Cyber Security by May 2013.

H. Credit Unit

The basic unit of academic credit at the City College is the semester hour. This normally represents one hour of lecture or recitation or two hours of laboratory per week.

Further, in cases where the criteria specify curricular content in terms of years, one year is equivalent to either 32 semester hours (48 quarter hours) or the quotient of the number of credits required for graduation divided by the nominal length of the program in years, whichever is less. Thus, for programs with 128 semester hours (192 quarter credits) or greater, one year is 32 semester hours (48

quarter hours). For programs with less than 128 semester hours (192 quarter credits), one year is the number of credits required for graduation divided by the nominal length of the program in years.

I. Instructional Modes

Engineering courses are traditional and on-campus. The College has a number of “Smart Classrooms” available and enables instructors to conduct multi-media presentations. In addition, the Center for Excellence in Teaching and Learning provides instruction in “Blackboard” technology and a variety of other tools for faculty and teaching enhancement. CCNY has offered a limited number of hybrid/online courses to date. However, with the support of a new administration and stipends for faculty development, we expect that hybrid and online courses will see significant increases in the future.

J. Grade-Point Average (GPA) Required for Graduation

One requirement for graduation is an average of C (GPA of 2.0) or better for all courses relevant to the student's degree. Calculation of the GPA is described in *The City College Undergraduate Bulletin 2009-2011* (page 289). Note that once a student passes a course, only the first passing grade is counted in the GPA. Since a grade of D is passing, students who receive a grade of D and subsequently retake the course will not have the new grade included in the GPA except for courses requiring a minimum grade of C. In these courses all grades will count, up to the including the C.

Another requirement for graduation is a Quality Point Accumulation (QPA) of zero or better in the student's major courses. Unless stated otherwise, major courses include only courses offered by the student's department and no other courses. For example, computer science courses, although required for the civil, electrical, and mechanical engineering degrees, are not included in QPA calculations for those majors. QPA calculation in the computer engineering degree counts all computer science and electrical engineering courses.

In calculating QPA, the following weighting factors apply:

A = +2

B = +1

C = 0

D = -1

F = -2

A grade of F represents all failing grades including F, FAB, FIN, FPN, WF, and WU. The weighting factors are multiplied by the number of credits for each major course, and the results of all multiplications are added together. A final score of zero is equivalent to a C average. Negative scores are equivalent to averages lower than C; positive scores are equivalent to averages higher than C. One advantage of this method is that it allows failing or marginal students to determine the grades required in their remaining major courses to graduate.

Note that the CUNY-wide "F" Repeat policy, described in *The City College Undergraduate Bulletin 2007-2009* (page 295), does not apply to Engineering QPA calculations. All engineering programs have additional requirements concerning grades that are required in certain courses taken either within or outside the major. These additional requirements are specified in the relevant section of the Self-Study

Report for that program. The additional requirements are also listed in the section of the Undergraduate Catalog where the degree program is described.

K. Academic Supporting Units

Information on academic departments that provide required instruction in support of one or more engineering curricula is shown in Table II

L. Non-Academic Supporting Units

Comment [AA5]: update where needed

Library

The City College of New York library system includes: the Morris Raphael Cohen Library (North Academic Center), the Science/Engineering Library (Marshak 29), the Music Library (Shepard 160), the Architecture Library (Spitzer 101), the Art Visual Resources Library (Compton Goethals 245A), the Architecture Visual Resources Library (Spitzer 104), the Center for Worker Education Library (25 Broadway) and the Dominican Studies Institute Library (North Academic Center 2/202).

The CCNY library collections, the largest in CUNY system, total more than 1.44 million volumes, 85,000 e-books, 901,000 microforms, 34,000 scores and recordings, 7,800 films and videos, and 1.3 million digital images. Designated a Federal depository in 1884, the library has 232,000 government documents. Online periodical holdings include 55,000 electronic subscriptions. The library serves the instructional and research needs of students at the undergraduate through doctoral levels, supports faculty research and provides information literacy instruction at all levels. Our program of "individualized library service" connects library faculty to each department, its faculty and its majors. The library hosts a full calendar of exhibitions, readings, lectures and programs in multiple venues.

The CUNY Plus on-line catalog provides access to library holdings both at CCNY and all the libraries in CUNY, and is available worldwide on the web. The CCNY library web site at http://www1.ccny.cuny.edu/library provides up-to-the-minute information and our "Databases A-Z" site at http://134.74.20.33/resources/databases.jsp provides quick and easy access to myriad digital resources in all subjects, most with full text. Of relevance to Engineering are offerings such as EI Engineering Village, IEEE Xplore, ASME. ASCE, ACM, ScienceDirect, MathSciNet, ACS, AIP, APS, SpringerLink, Wiley-Blackwell, Web of Science, ASTI, BioOne, Medline, PubMed and more.

Computing

Infrastructure Improvement

In 2001, the College began a radical upgrade of the campus network and academic computing resources. These upgrades were the results of a number of initiatives:

- A three-year, $3.4 million, network infrastructure initiative funded by CUNY;
- $805,000 in Equipment Replacement fund (2000-02) to upgrade facilities;
- Establishment (2001-02) of a student technology fee with estimated revenue of $1.2 million/year for CCNY which has now grown to $2.4 million;
- A $295,000 fund from the Borough of Manhattan President's Office to develop information kiosk systems and smart classrooms;
- Startup funds ($90,000) to participate in NYSERNet's Dark Fiber project linking research/educational institution in New York City to commercial and research networks.

In 2001, in phase I, the College replaced the T1 connection to its Internet provider by a new ATM circuit and upgraded the campus network to a Gigabit backbone (1000 Mb/sec) with a star topology (from 10Mb/sec fiber ring). It has provided the College with a stable and secure foundation for our emerging computing network environment. Since then the aging ATM has been retired and replaced with two 1 Gigabit per second SONET circuits over the abovementioned NYC Dark Fiber network. Additional 100 Mb/sec Verizon EVPL service will be installed to provide a backup connection, to prevent against the College being disconnected from CUNY central and the Internet in the case of damage to the NYC fiber network.

The current network expansion plans include: upgrading some of the campus backbone connectivity to 10 Gb/sec; creating a dual star topology providing every building with logical and physical safety against a single point of failure causing any network disconnection; expanding the campus network to the new south campus Science complex; establishing a second entry point to campus from the NYC Dark Fiber; establishing Gigabit microwave connectivity to certain buildings which have a single fiber connectivity to the core; expanding wireless network to every building and outside area serving the College community; establishing new network security measures to protect the College assets.

In addition to these investments in the data network, the College has made improvements in a number of other infrastructure areas: The aging Siemens Rolm telephone system was replaced with a state of the art, $2.2 million NEC switch and telephones which support Voice over IP connections in addition to traditional analog and digital services. Indeed, all of the new buildings being developed on the South campus will be served using VoIP, as is the newly renovated Spitzer School of Architecture building there. A newly established Compact fund has enabled the College to put A/V equipment in nearly all registrar-managed classrooms, and to continue to expand this design to all teaching facilities.

Between the summer 2002 and spring 2003, the College distributed over 600 computers (over 400 new acquisitions) to student laboratory facilities, faculty and staff. During the summer 2003, another 350 additional computers were distributed to student laboratory facility and new faculty. This effort included upgrading of computer laboratories in the departments of computer science, and electrical engineering, and establishment of a new general computer lab for the School of Engineering.

Computing Systems Administration

The CCNY Information Technology and Computer Services Department provides computing facilities and services for the college's teaching, research, public service, and administrative activities. It maintains several general computer labs available to all CCNY students, faculty and staff members, and many special-purpose computer labs available to students in selected courses. CCNY's primary mail server provides an e-mail account to every member of the CCNY community. The CCNY Data Center in the NAC building which houses all the servers providing these services, is also used for high performance computing facilities (including SGI, SUN, Dell, Apple clusters) for selected, grant funded projects. This data center recently underwent an assessment to determine the necessary HVAC, electrical, cabling, room design, security, and safety improvements, as well as measures to improve energy efficiency. A multi-year Data Center renovation plan is underway. Much of the centrally provided services are being migrated to blade servers using VMware technology.

Software available on the Windows, MAC, and UNIX computers at CCNY includes most of the commonly used compilers and interpreters, and a large number of programs for statistical, mathematical, engineering, operations research, and graphics applications. CUNY has purchased many software licenses to be used throughout the College. CUNY participates in educational programs sponsored by Apple, IBM, SGI and SUN providing software packages at reduced or no cost. CUNY has also arranged for discounted volume purchase pricing of other software programs as well. As a senior

college, CCNY takes full advantage of these programs. Mr. Kent Eng is the site license coordinator at CCNY.

Engineering Computer Facilities

The client-server networks in the departments of the School of Engineering (SOE) are the primary computational resource for the School. Currently, SOE has a total of approximately 1160 networked machines, among them 40 SUN workstations, 950 networked PC's, 60 networked MAC's and 110 other workstations, and network printers.

Most of these machines are maintained in the departments, research centers and institutes of the SOE. Some systems are located in their computational laboratories, experimental laboratories and faculty and administration offices. About 45 machines are configured as servers. Most of them are UNIX machines and a few are windows based servers. They are multi-purposed servers; serving as file servers, application servers, mail servers, web servers, network information servers, etc. Additionally, a school-wide computing laboratory is located at Steinman T-B2 and is open to all engineering students.

These networked computers are connected via the networking infrastructure for the SOE, and are then connected to other parts of the College via the College's network facilities Fiber backbone - which supports 1 GB of data. All rooms in the engineering building - Steinman Hall, have networked outlets for Internet/Network connectivity. Each room for the building is connected via Cat5+ UTP cable to a Cisco switch located in the IDF closest on each floor. Each switch is then connected via fiber cables to a Cisco 4000 series router located on the first floor – MDF room. All traffic to the rest of the campus and public Internet is routed at this location.

The local area networks (LANs) in the building are mainly 100 MB Fast Ethernet; with the exception of a few servers which are connected to a switch via gigabit Ethernets. The gigabit campus backbone links the individual units of City College, and is connected to the CUNY Central (CIS), via a 1 Gb/sec optical dual ring network. CUNY Central is current operating two connections to the commercial Internet running at 1 Gb/sec speed each. In addition a 100Mb/sec Internet2 connection is available for the CUNY research community. With the establishment of the College of Staten Island CUNY High Performance Computing Facility and the recent upgrade of its connectivity to CUNY Central, a shared cluster is now available to students and researchers with computational needs but without access to such facilities at CCNY or elsewhere.

The Computer Sciences Department, which is the only department in the GSOE not located in Steinman Hall (engineering building) has a similar network infrastructure in the NAC building.

The computer facilities in each department are under the control of the individual departments. Day-to-day system administration functions are performed by the department. Each department maintains its own user accounts and installs the application software in its particular fields on its servers. All students, faculty and staff have their departmental computer accounts, which can be used for their computation and Internet needs on all UNIX or Window NT computers in the department. Since most networked computers in the School are connected to the Internet, users can also access these computers remotely through any Internet service provider. Temporary accounts in some computational laboratories for a specific course are assigned to students from different departments.

The computer systems manager of the GSOE (Dr. Shaoquan Lin) and his team (comprising of selected faculty/staff member from each department) oversees the School's network, its inter-connectivity on the campus, and the Internet connection of the College. They design, install and configure the computer systems; install major application software packages, such as AutoCAD, ANSYS, ASPEN, Fluent,

IMSL, Maple, MATLAB, Mathematica, and ProE etc.; and provide technical support and second-level help for the departments. They also control the key equipment in the departments, such as the servers.

The Grove School's own computer facilities have become the primary computational resource for the SOE. The hardware in terms of the number of computers is adequate. The School has been replacing equipment on a lab-by-lab basis as funds become available. This approach has been adequate to replace the outmoded student instructional laboratories as well as of faculty machines.

Accessibility of Computer Facilities

Computer facilities are maintained by individual departments with the schedules and other operational policies, processes and procedures set according to the needs of the individual departments and they differ among departments.

There has been an explosion in use of the network for e-mail communication, Internet access and academic computing by faculty. Likewise, students are introduced to networked computing in their freshman design course and take full advantage of the system thereafter. Access to computer labs is provided and controlled by the departments. Laboratory access is not a problem during the day and generally there is little or no wait for students to access a computer. After-hours accessibility is somewhat limited. Generally student assistants are used to staff and monitor laboratories after hours.

Instructional Computing Services Cost

The short life span of computer hardware and software requires continuous investment. Computers become obsolete in every few years, and in every few months new versions of software appear. No separate budget allocation to the School is provided for instructional computing services or equipment in support of undergraduate instruction for its majors. It is completely funded from the School of Engineering budget. Since the 2001-02 academic years, the newly instituted technology fee of $75 per student ($37.50 for part-time students) per semester has allowed for upgrades and replacement of equipment. In 2007-08 this fee was increased to $100 per full time student and $50 per part-time student per semester.

Administrative Computing

In spring 2000, the CCNY implemented the computerized SIMS (Student Information Management System) to replace the antiquated IBM mainframe-based computer system for student advising and registration. Once assigned a user account, any faculty or academic adviser can easily access this system from a PC or a UNIX workstation. Depending on the level of authorization, a SIMS user can track any student's transcript and registration as well as any course's enrolled roster. All pre- and co-requisites have been incorporated into the SIMS; thus ensuring students' academic progress following closely his/her program's curricular design.

Since then, SIMS has become the core student administration system of CUNY, but has been enhanced by a number of initiatives. A single-sign-on user interface under the CUNY portal allows access to eSIMS; as well as Degreeworks, which tracks the course requirements from any College degree and discipline; CUNY Alert to register for the emergency notification system; and Blackboard, CUNY's Learning Management System. eSIMS allows for online registration, paying of bills and a number of other administrative student services.

It should be pointed out that new and re-entering students (including freshmen and transfer) are required to do in-person registration to ensure they receive high quality person-to-person advising before taking any CCNY course. Students who are on probation are also required to do in-person registration to ensure that their academic progress is closely monitored.

Since 2007, CUNY has embarked upon the ambitious, multiyear "CUNY First" project to upgrade all of its major administrative systems using PeopleSoft technology. The first stage of this upgrade started with General Ledger becoming available in July 2008; next the Human Resources systems (Human Capital Management and Talent Acquisition Module) became operational in 2009. Procurement and Accounts Payable (other components of the PeopleSoft Financials package) to became available soon after, in (year). The Student System (Campus Solutions) is expected to become operational for CCNY in Fall 2013 (?) . The latter will replace a number of legacy systems including SIMS (Student Information Systems) and a number of admissions and financial aid support systems. The City College has designed and operates a CUNY First training facility for all Manhattan CUNY campuses.

Additional Non-Academic Supporting Units

The City College has several programs that provide non-academic support to students. All students at the College, including engineering students, can access and benefit from services offered through these units.

The primary non-academic support units at the College are:

- Office of Student Services
- Office of Students with Disabilities
- Office of International Student and Scholar Services
- Wellness and Counseling Center
- Psychological Center
- John Finley Student Center
- Career Center
- Child Development and Family Service Center
- Veteran's Affairs
- Campus Safety
- Food Services
- The Towers (on-campus housing)
- Fitness Center

Offices that provide services to special populations, including engineering students, are:

- McCauley Honors College
- CCCNY Honors Program
- SSSP (Student Support Services Program
- SEEK (Search for Education, Elevation and Knowledge Program.

The primary programs listed are described in the Student Services section of *The City College Undergraduate Bulletin* and is posted at the websitehttp://www.ccny.cuny.edu/registrar/bulletins.cfm. . In this same source, other special population program descriptions can be found on: McCauley Honors Program and CCNY Honors Program (page 283); SEEK (Page 186); ad SSP (Page 186)

M. Faculty Workload

The maximum faculty teaching load is prescribed by the PSC-CUNY collective bargaining agreement as 21 contact hours per academic year. This is the workload basis. Faculty are given released time from teaching for significant administrative or guidance tasks, supervision of Masters or Ph.D. students,

sponsored research, curriculum and research development, and class sizes greater than 35 students. Beginning GSOE faculty members are assigned no more than six contact hours for each of their first two years. Typical teaching loads for research-active faculty with external support range from six to twelve contact hours per year. In general, all faculty, except new faculty, distinguished professors and department chairperson, are required to teach at least three courses per year.

N. Tables

N.1 Charts

Table D-1. Programs Offered by the Educational Unit

1 Program Title	2 Modes Offered					3 Nominal Years to Complete	4 Administrative Head	5 Administrative Unit or Units (e.g. Dept.) Exercising Budgetary Control	6 Accredited		7 Assessment Protocol	
	Day	Co-op	Off Campus	Alt. Mode	Other				ABET	Middle States	ABET	Middle States
Biomedical Engineering (BE)	X					4	Dr. John Tarbell	Biomedical Engineering	X	X	X	*
Chemical Engineering (BE)	X					4	Dr. Jeffrey Morris	Chemical Engineering	X	X	X	*
Civil Engineering (BE)	X					4	Dr. Julio Davalos	Civil Engineering	X	X	X	*
Computer Engineering (BE)	X					4	Dr. Roger Dorsinville& Dr. Douglas Troeger	Computer Science & Electrical Engineering	X	X	X	*
Computer Science (BS)	X					4	Dr. Douglas Troeger	Computer Science	X	X	X	*
Earth System Science and Environmental Engineering (BE)	X					4	Dr. Fred Moshary	GSOE & Division of Science	X	X	X	*
Electrical Engineering (BE)	X					4	Dr. Roger Dorsinville	Electrical Engineering	X	X	X	*
Mechanical Engineering (BE)	X					4	Dr. FeridunDelale	Mechanical Engineering	X	X	X	*
Biomedical Engineering (MS)	X					2	Dr. John Tarbell	Biomedical Engineering		X		X
Chemical Engineering (ME)	X					2	Dr. Jeffrey Morris	Chemical Engineering		X		X
Civil Engineering (ME)	X					2	Dr. Julio Davalos	Civil Engineering		X		X
Computer Science (MS)	X					2	Dr. Douglas Troeger	Computer Science		X		X
Electrical Engineering (ME)	X					2	Dr. Roger Dorsinville	Electrical Engineering		X		X
Engineering (MS)	X					2	Dr. Ardie Walser	School of Engineering		X		X
Mechanical Engineering (ME)	X					2	Dr. FeridunDelale	Mechanical Engineering		X		X
Information Systems	no				Eve	2	Dr. Akira Kawaguchi	Computer Science		X		X
Sustainability in the Urban Environment (MS)	X					2	Dr. Alan Feigenberg (Arch.)	GSOE, Sch. Architecture, Div. of Science		**		**

Doctoral Programs (Ph.D.) , Graduate Office *	X					3+	Dr. Ardie Walser	Graduate Center and CCNY / CCNY (from fall 2013)				X
Biomedical Engineering (Ph.D.)	X					3+	Dr. John Tarbell	CCNY				
Chemical Engineering (Ph.D.)	X					3+	Dr. Jeffrey Morris	CCNY				
Civil Engineering (Ph.D.)	X					3+	Dr. Julio Davalos	CCNY				
Electrical Engineering (Ph.D.)	X					3+	Dr. Roger Dorsinville	CCNY				
Mechanical Engineering (Ph.D.)	X					3+	Dr. Feridun Delale	CCNY				

* Accreditation requirement fulfilled hrough ABET accreditation.
** Interdisciplinary Programs Reviewed and Assessed by Provost Office.
*** Doctoral program in Computer Science is a CUNY-wide program and its Executive Officer resides outside of CCNY.

Table D-2. Degrees Awarded and Transcript Designations by Educational Unit*

1 Program Title	2 Modes Offered					3 Name of Degree(s) Awarded	4 Designation on Transcript
	Day	Co-op	Off-Campus	Alt. Mode	Other		
Biomedical Engineering	X					Bachelor of Engineering (BME)	
Chemical Engineering	X					Bachelor of Engineering (Ch.E.)	
Civil Engineering	X					Bachelor of Engineering (C.E.)	
Computer Engineering	X				**	Bachelor of Engineering (Cp.E.)	
Computer Science	X				**	Bachelor of Engineering (C.Sc.)	
Earth System Science and Environmental Engineering	X					Bachelor of Engineering (EvE)	
Electrical Engineering	X				**	Bachelor of Engineering (E.E.)	
Mechanical Engineering	X					Bachelor of Engineering (M.E.)	
Biomedical Engineering	X					Master of Science: M.S. (BME)	

Comment [AA6]: complete table

Chemical Engineering	X					Master of Engineering: M.E. (Ch.E.) (Professional Master's Degree),; Master of Science: M.S. (Engineering) ***	
Civil Engineering	X					Master of Engineering: M.E. (C.E.) (Professional Master's Degree),; Master of Science: M.S. (Engineering) ***	
Computer Science	X					Master of Science: M.S. (C.Sc.)	
Electrical Engineering	X					Master of Engineering: M.E. (E.E.) (Professional Master's Degree),; Master of Science: M.S. (Engineering) ***	
Interdisciplinary Program in Engineering	X					Master of Science (I.E.P.))	
Mechanical Engineering	X					Master of Engineering: M.E.(M.E.) (Professional Master's Degree),; Master of Science: M.S. (Engineering) ***	
Information Systems	no				Eve.	Master of Science (M.I.S.)	
Sustainability in the Urban Environment	X					Master of Science: M.S. (M.S.)	
Biomedical Engineering	X					Doctor of Philosophy in Biomedical Engineering (Ph.D.) ****	
Chemical Engineering	X					Doctor of Philosophy in Chemical Engineering (Ph.D.) ****	
Civil Engineering	X					Doctor of Philosophy in Civil Engineering (Ph.D.) ****	
Electrical Engineering	X					Doctor of Philosophy in Electrical Engineering (Ph.D.) ****	
Mechanical Engineering	X					Doctor of Philosophy in Mechanical Engineering (Ph.D.) ****	

* Doctoral degrees in Biomedical, Chemical, Civil, Electrical, and Mechanical Engineering and Computer Science are awarded through the CUNY Graduate Center to students starting before fall 2008 and finishing before fall 2013. Doctoral degrees are awarded by CCNY to students starting in or transferring to CCNY from fall 2008 onward

** Day or Evening designation is indicated upon enrollment and does not restrict course selection to day or evening hours.

*** M.S. Degree is awarded to students who do not have a bachelor's degree in engineering.

**** Upon Advancement to the Candidacy students receive the Master of Philosophy (M.Phil.) Degree.

Table D-3a-i. Support Expenditures

Comment [AA7]: updates in progress

TABLE D-3a SUPPORT EXPENDITURES OF ENGINEERING
School of Engineering

Fiscal Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-2013
Expenditure Category	(4 yr. prior to previous year)	(3 yr. prior to previous year)	(2 yr. prior to previous year)	(1 yr. prior to previous year)	(previous year)	(current year)	(next year prognosis)
Operations (1) (not including staff)	$380,000 OTPS $70,195 Addl. OTPS $59,115 TS $286,128 Sur Ch	$380,000 OTPS $222,994 Addl. OTPS $94,393 TS $351,969 Sur Ch	$380,000 OTPS $864,460 Addl. OTPS $134,502 TS $330,868 Sur Ch	$380,000 OTPS $160,567 Addl. OTPS $178,337 TS Sur Ch in Add OTPS/TS			
Travel (2)	$16,067	$14,519	$17,376	$15,567			
Equipment (3)							
(a) Institutional Funds	$33,500	$144,000	$103,200	$873,350			
(b) Grants and Gifts (4)	$961,100	$1,302,020	$230,741	$428,012			
GRTI Equipment**	$262,000	$410,000	$657,000	$642,500			
Grad.Teaching Assistant (5)	$195,000	$222,000	$676,000	$779,000			
GC Fellowships***	$1,031,000	$920,000	$512,000	$276,000 GC 988,000 CCNY			
Part-time Assistance (6)	$223,000	$184,000	$217,000				

(1) Central operations and equipment, excluding telephone, postage, faculty recruitment and research related expenses.
(2) Centrally administered School of Engineering pool, does not include grant/contract-related travel.
(3) Major equipment, excluding equipment primarily used for research.
(4) Including special (not part of institution's annual state appropriation) non-recurring equipment purchase programs.
(5) Includes all institutionally funded service-connected graduate student support other than institutional fellowship support
(6) Does not include graduate teaching and research assistant or permanent part-time personnel.
*** $9,100 of which was provided from OTPS fund.**
**** Equipment procured through Graduate Research and Training Initiative (GRTI) is used for both research and teaching purposes.**
***** A portion of Graduate Center (GC) fellowships (~15%) provides instruction support through the use of graduate teaching fellows.**

TABLE D-3b SUPPORT EXPENDITURES OF ENGINEERING
Biomedical Engineering

Fiscal Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-2013
Expenditure Category	(4 yr. prior to previous year)	(3 yr. prior to previous year)	(2 yr. prior to previous year)	(1 yr. prior to previous year)	(previous year)	(current year)	(next year prognosis)
Operations (1) (not including staff)	$36,988 OTPS $18,036 Addl. OTPS $0 TS $16,721 Sur Ch	$51,572 OTPS $0 Addl. OTPS $0 TS $17,009 Sur Ch	$39,778 OTPS $36,174 Addl. OTPS $0 TS $0 Sur Ch	$39,778 OTPS $13,402 Addl. OTPS $0 TS Sur Ch in Add OTPS			
Travel (2)	$1,432	$1,152	$1,366	$1,600			
Equipment (3)							
(a) Institutional Funds (Tech Fee)	$0	$22,000	$26,2000	$235,026			
(b) Grants and Gifts (4)	$178,790	$183,334	$52,338	$153,651			
GRTI Equipment*			$200,000	$150,000			
Graduate Teaching Assistant (5)	$28,000	$32,000		$27,000			
GC Fellowships**	$139,000	$160,000	$86,000	$26,000 GC $152,000 CCNY			
Part-time Assistance (6)	$36,000	$36,000	$45,000				

(1) Central operations and equipment, excluding telephone, postage, faculty recruitment and research related expenses.
(2) Centrally administered School of Engineering pool, does not include grant/contract-related travel.
(3) Major equipment, excluding equipment primarily used for research.
(4) Including special (not part of institution's annual state appropriation) non-recurring equipment purchase programs.
(5) Includes all institutionally funded service-connected graduate student support other than institutional fellowship support
(6) Does not include graduate teaching and research assistant or permanent part-time personnel.
*** Equipment procured through Graduate Research and Training Initiative (GRTI) is used for both research and teaching purposes.**
**** A portion of Graduate Center (GC) fellowships (~15%) provides instruction support through the use of graduate teaching fellows.**

TABLE D-3c SUPPORT EXPENDITURES OF ENGINEERING
Chemical Engineering

Fiscal Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-2013
Expenditure Category	(4 yr. prior to previous year)	(3 yr. prior to previous year)	(2 yr. prior to previous year)	(1 yr. prior to previous year)	(previous year)	(current year)	(next year prognosis)
Operations (1) (not including staff)	$38,124 OTPS $0 Addl. OTPS $0 TS $17,082 Sur Ch	$42,060 OTPS $5,008 Addl. OTPS $7,299 TS $20,334 Sur Ch	$40,746 OTPS $423,980 Addl. OTPS $0 TS $0 Sur Ch	$40,746 OTPS $11,666 Addl. OTPS $0 TS Sur Ch in Add OTPS			
Travel (2)	$2,227	$1,725	$2,389	$2,037			
Equipment (3)							
(a) Institutional Funds	$0	$0	$0	$101,251			
(b) Grants and Gifts (4)	$74,873	$211,894	$7,251	$39,458			
GRTI Equipment*	$138,000			$150,000			
Graduate Teaching Assistant (5)	$42,000	$48,000	$42,000	$24,000			
GC Fellowships**	$192,000	$157,000	$99,000	$37,000 GC $228,000 CCNY			
Part-time Assistance (6)	$47,000	$28,000	$41,000				

(1) Central operations and equipment, excluding telephone, postage, faculty recruitment and research related expenses.
(2) Centrally administered School of Engineering pool, does not include grant/contract-related travel.
(3) Major equipment, excluding equipment primarily used for research.
(4) Including special (not part of institution's annual state appropriation) non-recurring equipment purchase programs.
(5) Includes all institutionally funded service-connected graduate student support other than institutional fellowship support
(6) Does not include graduate teaching and research assistant or permanent part-time personnel.
*** Equipment procured through Graduate Research and Training Initiative (GRTI) is used for both research and teaching purposes.**
**** A portion of Graduate Center (GC) fellowships (~15%) provides instruction support through the use of graduate teaching fellows.**

TABLE D-3d SUPPORT EXPENDITURES OF ENGINEERING
Civil Engineering

Fiscal Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-2013
Expenditure Category	(4 yr. prior to previous year)	(3 yr. prior to previous year)	(2 yr. prior to previous year)	(1 yr. prior to previous year)	(previous year)	(current year)	(next year prognosis)
Operations (1) (not including staff)	$63,734 OTPS $0 Addl. OTPS $0 TS $39,068 Sur Ch	$61,744 OTPS $20,871 Addl. OTPS $0 TS $34,002 Sur Ch	$68,426 OTPS $3,334 Addl. OTPS $18,290 TS $20,000 Sur Ch	$68,426 OTPS $73,895 Addl. OTPS $0 TS Sur Ch in Add OTPS			
Travel (2)	$2,386	$2,443	$2,235	$2,473			
Equipment (3)							
(a) Institutional Funds	$0	$45,000	$0	$149,914			
(b) Grants and Gifts (4)	$162,254	$299,395	$80,681	$28,591			
GRTI Equipment*			$100,000	$171,639			
Graduate Teaching Assistant (5)	$28,000	$32,000	$154,000	$198,000			
GC Fellowships**	$256,000	$228,000	$125,000	$44,000 GC $152,000 CCNY			
Part-time Assistance (6)	$31,000	$33,000	$33,000	$67,802			

(1) Central operations and equipment, excluding telephone, postage, faculty recruitment and research related expenses.
(2) Centrally administered School of Engineering pool, does not include grant/contract-related travel.
(3) Major equipment, excluding equipment primarily used for research.
(4) Including special (not part of institution's annual state appropriation) non-recurring equipment purchase programs.
(5) Includes all institutionally funded service-connected graduate student support other than institutional fellowship support
(6) Does not include graduate teaching and research assistant or permanent part-time personnel.
*** Equipment procured through Graduate Research and Training Initiative (GRTI) is used for both research and teaching purposes.**
**** A portion of Graduate Center (GC) fellowships (~15%) provides instruction support through the use of graduate teaching fellows.**

TABLE D-3e SUPPORT EXPENDITURES OF ENGINEERING

Computer Engineering *

*** This is an interdisciplinary program, not a department. It is funded by the Grove School of Engineering, but does not have a separately administered budget. It draws on the faculty and facilities of two departments, Computer Science and Electrical Engineering; and has one dedicated line, the administrative director. There are no other dedicated Computer Engineering program expenses, and since Table D-3 does not include administrative and staff expenses, it would be entirely empty for the program.**

The program does, however, exist based on the resources of the two departments, in all of the categories shown in their Tables D-3 (*q.v.*).

TABLE D-3f SUPPORT EXPENDITURES OF ENGINEERING
Computer Science

Fiscal Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-2013
Expenditure Category	(4 yr. prior to previous year)	(3 yr. prior to previous year)	(2 yr. prior to previous year)	(1 yr. prior to previous year)	(previous year)	(current year)	(next year prognosis)
Operations (1) (not including staff)	$53,338 OTPS $32,783 Addl. OTPS $8,000 TS $26,900 Sur Ch	$52,213 OTPS $0 Addl. OTPS $6,150 TS $25,247 Sur Ch	$57,284 OTPS $7,219 Addl. OTPS $9,280 TS $0 Sur Ch	$47,384 OTPS $49,270 Addl. OTPS $2,337 TS Sur Ch in Add OTPS			
Travel (2)	$3,659	$3,162	$5,673	$3,201			
Equipment (3)							
(a) Institutional Funds	$16,500	$0	$18,500	$60,427			
(b) Grants and Gifts (4)	$30,089	$18,545	$1,134	$22,173			
GRTI Equipment*	$40,000			$77,861			
Graduate Teaching Assistant (5)	$26,880	$40,451	$43,125	$33,149			
GC Fellowships**	-	-	-	-			
Part-time Assistance (6)	$0	$0	$0				

(1) Central operations and equipment, excluding telephone, postage, faculty recruitment and research related expenses.
(2) Centrally administered School of Engineering pool, does not include grant/contract-related travel.
(3) Major equipment, excluding equipment primarily used for research.
(4) Including special (not part of institution's annual state appropriation) non-recurring equipment purchase programs.
(5) Includes all institutionally funded service-connected graduate student support other than institutional fellowship support
(6) Does not include graduate teaching and research assistant or permanent part-time personnel.
*** Equipment procured through Graduate Research and Training Initiative (GRTI) is used for both research and teaching purposes.**
**** Graduate Center (GC) fellowships for computer science is not CCNY-focused but it is CUNY-wide.**

TABLE D-3g SUPPORT EXPENDITURES OF ENGINEERING
Electrical Engineering

Fiscal Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-2013
Expenditure Category	(4 yr. prior to previous year)	(3 yr. prior to previous year)	(2 yr. prior to previous year)	(1 yr. prior to previous year)	(previous year)	(current year)	(next year prognosis)
Operations (1) (not including staff)	$82,310 OTPS $38,500 Addl. OTPS $9,614 TS $26,486 Sur Ch	$87,340 OTPS $68,000 Addl. OTPS $9,000 TS $30,932 Sur Ch	$74,748 OTPS $223,376 Addl. OTPS $9,280 TS $0 Sur Ch	$74,748 OTPS $50,709 Addl. OTPS $35,000 TS Sur Ch in Add OTPS			
Travel (2)	$3,977	$3,737	$3,478	$3,783			
Equipment (3)							
(a) Institutional Funds	$0	$13,000	$0	$146,574			
(b) Grants and Gifts (4)	$171,294	$333,876	$13,552	$39,625			
GRTI Equipment*	$71,500	$0	$0	$93,000			
Grad.Teaching Assistant (5)	$70,000	$80,000	$250,000	$126,000			
GC Fellowships**	$247,000	$218,000	$108,000	$113,000 GC $266,000 CCNY			
Part-time Assistance (6)	$66,000	$47,000	$129,664	$180,000			

(1) Central operations and equipment, excluding telephone, postage, faculty recruitment and research related expenses.
(2) Centrally administered School of Engineering pool, does not include grant/contract-related travel.
(3) Major equipment, excluding equipment primarily used for research.
(4) Including special (not part of institution's annual state appropriation) non-recurring equipment purchase programs.
(5) Includes all institutionally funded service-connected graduate student support other than institutional fellowship support
(6) Does not include graduate teaching and research assistant or permanent part-time personnel.
*** Equipment procured through Graduate Research and Training Initiative (GRTI) is used for both research and teaching purposes.**
**** A portion of Graduate Center (GC) fellowships (~15%) provides instruction support through the use of graduate teaching fellows.**

TABLE D-3h SUPPORT EXPENDITURES OF ENGINEERING

Earth System Science and Environmental Engineering

This is an interdisciplinary program, not a department. The majority of the program's support is leveraged from other participating departments (mainly through course instruction). It draws on the faculty and facilities of seven departments; and has one dedicated line, the administrative director. The program receives additional support through the Gove School of Engineering, the Division of Sciences, and through external grants as indicated in the table below.

Fiscal Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-2013
Expenditure Category	(4 yr. prior to previous year)	(2 yr. prior to previous year)	(3 yr. prior to previous year)	(1 yr. prior to previous year)	(previous year)	(current year)	(next year prognosis)
Additional Support	$5,000 (NOAA-CREST)	$6,000 + $ 2,000 (NOAA-CREST)	$10,000 (CCNY)	$14,599			
Operations (1) (not including staff)							
Travel (2)							
Equipment (3)				$13,000			
(a) Institutional Funds (Tech Fee)							
(b) Grants and Gifts (4)							
GRTI Equipment*							
Grad.Teaching Assistant (5)							
GC Fellowships**							
Part-time Assistance (6)							

(1) Central operations and equipment, excluding telephone, postage, faculty recruitment and research related expenses.
(2) Centrally administered School of Engineering pool, does not include grant/contract-related travel.
(3) Major equipment, excluding equipment primarily used for research.
(4) Including special (not part of institution's annual state appropriation) non-recurring equipment purchase programs.
(5) Includes all institutionally funded service-connected graduate student support other than institutional fellowship support
(6) Does not include graduate teaching and research assistant or permanent part-time personnel.
*** Equipment procured through Graduate Research and Training Initiative (GRTI) is used for both research and teaching purposes.**
**** A portion of Graduate Center (GC) fellowships (~15%) provides instruction support through the use of graduate teaching fellows.**

TABLE D-3i SUPPORT EXPENDITURES OF ENGINEERING
Mechanical Engineering

Fiscal Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-2013
Expenditure Category	(4 yr. prior to previous year)	(3 yr. prior to previous year)	(2 yr. prior to previous year)	(1 yr. prior to previous year)	(previous year)	(current year)	(next year prognosis)
Operations (1) (not including staff)	$59,504 OTPS $0 Addl. OTPS $11,945 TS $23,743 $0 Sur Ch	$50,882 OTPS $8,000 Addl.OTPS $34,844 TS $20,342 $0 Sur Ch	$49,018 OTPS $32,604 Addl. OTPS $12,000 TS $0 Sur Ch	$49,018 OTPS $21,589 Addl. OTPS $0 TS Sur Ch in Add OTPS			
Travel (2)	$2,386	$2,300	$2,235	$2,473			
Equipment (3)							
(a) Institutional Funds	$17,000	$57,000	$58,000	$180,158			
(b) Grants and Gifts (4)	$103,563	$17,889	$20,393	$47,482			
GRTI Equipment*	$71,750	$88,162	$35,670	$0			
Grad. Teaching Assistant (5)	$14,000	$16,000	$149,000	$166,000			
GC Fellowships**	$197,000	$157,000	$94,000	$56,000 GC $190,000 CCNY			
Part-time Assistance (6)	$43,000	$40,000	$146,731	$89,317			

(1) Central operations and equipment, excluding telephone, postage, faculty recruitment and research related expenses.
(2) Centrally administered School of Engineering pool, does not include grant/contract-related travel.
(3) Major equipment, excluding equipment primarily used for research.
(4) Including special (not part of institution's annual state appropriation) non-recurring equipment purchase programs.
(5) Includes all institutionally funded service-connected graduate student support other than institutional fellowship support
(6) Does not include graduate teaching and research assistant or permanent part-time personnel.
*** Equipment procured through Graduate Research and Training Initiative (GRTI) is used for both research and teaching purposes.**
**** A portion of Graduate Center (GC) fellowships (~15%) provides instruction support through the use of graduate teaching fellow**

Table D-4a. Personnel and Students

PERSONNEL AND STUDENTS

School of Engineering

Fall 2009, Fall 2012

Comment [AA8]: Verification needed for 2012 data

TYPE	HEAD COUNT 2009		FTE	RATIO TO FACULTY	HEAD COUNT 2012		FTE	RATIO TO FACULTY
	FT	**PT**						
Administrative	19		19					
Faculty (tenure-track)	113		113					
Other Faculty (excluding Student Assistants)								
Student Teaching Assistants (excludes institutional fellowships)		23	11.5					
Student Research Assistants								
Technicians/Specialists	14		14					
Office/Clerical Employees	12	2	13					
Others (Research Associates)	5		5					
Advisors	3		3					
Undergraduate Student Enrollment (Lower / Upper / All)								
Master's Student Enrollment								
Doctoral Student Enrollment (GC / GSOE / All)								

FTEs are calculated by dividing total credit+hours by 15 for undergraduates and by 12 for Master's students. Doctoral students are considered 1.0 FTE on average.

Table D-4b. Personnel and Students

Biomedical Engineering

Fall 2009, Fall 2012

TYPE	HEAD COUNT 2009		FTE	RATIO TO FACULTY	HEAD COUNT 2012		FTE	RATIO TO FACULTY
	FT	**PT**			**FT**	**PT**		
Administrative	1		1		1	0	1	
Faculty (tenure-track)	10		10		13	0	13	
Other Faculty (excluding Student Assistants)		1	.5		1	9	3	
Student Teaching Assistants (excludes institutional fellowships)	0	0	0		0	0	0	
Student Research Assistants (2012)					0	25		
Technicians/Specialists	1		1		1	0	1	
Office/Clerical Employees	1	1	1.5		1	2	2	
Others (Research Associates)	1				10	6	13	
Advisors					0	0	0	
Undergraduate Student Enrollment (Lower / Upper / All)	81/48/129	5/7/12	129		103/88/191	6/17/23	190	
Master's Student Enrollment	33		18		26		17	
Doctoral Student Enrollment (GC / GSOE / All)	27/10/37		37		6/34/40		40	

Table D-4c. Personnel and Students

Chemical Engineering

Fall 2009, Fall 2012

TYPE	HEAD COUNT 2009		FTE	RATIO TO FACULTY	HEAD COUNT 2012		FTE	RATIO TO FACULTY
	FT	**PT**			**FT**	**PT**		
Administrative	1		1		1	0	1	
Faculty (tenure-track)	15		15		15	0	15	
Other Faculty (excluding Student Assistants)		2	1		0	0	0	
Student Teaching Assistants (excludes institutional fellowships)		5	2.5		0	0	0	
Student Research Assistants (in Research Centers)					0	10		
Technicians/Specialists	2		2	0.17	2	0	2	
Office/Clerical Employees	1		1	0.08	1	1	1.5	
Others (Research Associates)	1				3	0	3	
Advisors	0	0	0		0	0	0	
Undergraduate Student Enrollment (Lower / Upper / All)	56/74/130	6/15/21	136		61/89/150	7/19/26	157	
Master's Student Enrollment	32		21		8		5	
Doctoral Student Enrollment (GC / GSOE / All)	24/13/37		37		4/39/43		43	

Table D-4d. Personnel and Students

Civil Engineering

Fall 2009, Fall 2012

TYPE	HEAD COUNT 2009		FTE	RATIO TO FACULTY	HEAD COUNT 2012		FTE	RATIO TO FACULTY
	FT	**PT**			**FT**	PT		
Administrative	1	0	1		1	0	1	
Faculty (tenure-track)	19		19		24	0	24	
Other Faculty (excluding Student Assistants)		7	3.5		0	9	3	
Student Teaching Assistants (excludes institutional fellowships)		3	1.5		0	11		
Student Research Assistants					0	21		
Technicians/Specialists	3		3		3	0	3	
Office/Clerical Employees	2		2	0.12	2	0	2	
Others (Research Associates)	1		1		2	0	2	
Advisors								
Undergraduate Student Enrollment (Lower / Upper / Total)	174/113/287	37/62/99	304		149/122/271	44/72/116	297	
Master's Student Enrollment	91		42		128		64	
Doctoral Student Enrollment (GC / GSOE / All)	19/12/31		31		2/33/35		35	

Table D-4e. Personnel and Students

Computer Engineering

Fall 2009, Fall 2012

Note: This is an interdisciplinary program, not a department. It draws on the faculty, staff and facilities of two departments, Computer Science and Electrical Engineering; and has one dedicated line, the administrative director.
• Numbers in (parentheses) count faculty from the two departments that have been officially designated as additionally serving the Computer Engineering program.
• Numbers in {braces} are total contributing personnel from both departments. Each does work that serves a department and also the program, without separate hours. Thus, no attempt is made to prorate.
• Unenclosed numbers count people exclusive to the program.

TYPE	HEAD COUNT 2009		FTE	RATIO TO FACULTY	HEAD COUNT 2012		FTE	RATIO TO FACULTY
	FT	**PT**						
Administrative	1 + {2}		1 + {2}					
Faculty (tenure-track)	(18)		(18)					
Other Faculty (excluding Student Assistants)		{18}	{9}					
Student Teaching Assistants (excludes institutional fellowships)		{9}	{4.5}					
Student Research Assistants								
Technicians/Specialists	{6}		{6}					
Office/Clerical Employees	{3}	{1}	{3.5}					
Others (Research Associates)								
Advisors								
Undergraduate Student Enrollment (Lower / Upper / All)	125/65/190	26/21/47	196		111/70/181	27/26/53	191	
Master's Student Enrollment	n.a.				n.a.			
Doctoral Student Enrollment (GC / GSOE / All)	n.a.				n.a.			

Table D-4f. Personnel and Students

Computer Science

Fall 2009, Fall 2012

TYPE	HEAD COUNT 2009		FTE	RATIO TO FACULTY	HEAD COUNT 2012		FTE	RATIO TO FACULTY
	FT	**PT**			**FT**	**PT**		
Administrative	3	2			2	0	2	
Faculty (tenure-track)	22		22		19	0	19	
Other Faculty (excluding Student Assistants)		7	3.5			14		
Student Teaching Assistants (excludes institutional fellowships)		3	1.75		0	0		
Student Research Assistants					0	0		
Technicians/Specialists					0	0		
Office/Clerical Employees	1		1		2	1	2.5	
Others (Research Associates)	2		2		2	0	2	
Advisors								
Undergraduate Student Enrollment (Lower / Upper / All)	84/60/144	15/21/36	146		78/66/144	23/28/51	155	
Master's Student Enrollment (incl. MIS)	112		63		99		56	
Doctoral Student Enrollment (GC /)	n.a.		n.a.		23		23	

Table D-4g Personnel and Students

Electrical Engineering

Fall 2009, Fall 2012

TYPE	HEAD COUNT 2009		FTE	RATIO TO FACULTY	HEAD COUNT 2012		FTE	RATIO TO FACULTY
	FT	**PT**			**FT**	**PT**		
Administrative	1		1		1	0	1	
Faculty (tenure-track)	26		26		27	0	27	
Other Faculty (excluding Student Assistants)		11	5.5		1	13	4.5	
Student Teaching Assistants (excludes institutional fellowships)		6	3		0	15		
Student Research Assistants					0	22		
Technicians/Specialists	4		4	0.19	5	0		
Office/Clerical Employees	2	1	2.5	0.10	2	1		
Others (Research Associates)	1				2	0		
Advisors								
Undergraduate Student Enrollment (Lower / Upper / All)	193/176/369	50/66/116	398		133/198/331	40/75/114	358	
Master's Student Enrollment	108		60		88		50	
Doctoral Student Enrollment (GC / GSOE / All)	43/21/64		54		10/44/54		33	

Table D-4h Personnel and Students

Earth Science and Environmental Engineering

Fall 2009-2012

Note: This is an interdisciplinary program, not a department. It draws on the faculty, staff and facilities of seven departments, Civil Engineering, Chemical Engineer, Mechanical Engineering, Computer Science, Electrical Engineering, Earth and Atmospheric Sciences, and the Chemistry department; and has one dedicated line, the administrative director.
• Numbers in (parentheses) count faculty from one of these departments that have been officially designated as additionally serving the ESE program.
• Numbers in {braces} are total contributing personnel from the participating departments. Each does work that serves a department and also the program, without separate hours. Thus, no attempt is made to prorate.
• Unenclosed numbers count people exclusive to the program

TYPE	HEAD COUNT 2009		FTE	RATIO TO FACULTY	HEAD COUNT 2012		FTE	RATIO TO FACULTY
	FT	**PT**			**FT**	**PT**		
Administrative	1	(1)	1 + (0.3)					
Faculty (tenure-track)		+ {30}	(0.3)					
Other Faculty (excluding Student Assistants)		{4}						
Student Teaching Assistants (excludes institutional fellowships)								
Student Research Assistants								
Technicians/Specialists		{3}						
Office/Clerical Employees		{2}						
Others (Research Associates)		{12}						
Advisors								
Undergraduate Student Enrollment (Lower / Upper / All)	17/15/32	2/9/11	35		21/38/59	2/14/16	64	
Master's Student Enrollment	n.a.				n.a.			
Doctoral Student Enrollment (GC / GSOE / All)	n.a.				n.a.			

Table D-4i. Personnel and Students

Mechanical Engineering

Fall 2009, Fall 2012

TYPE	HEAD COUNT 2009		FTE	RATIO TO FACULTY	HEAD COUNT 2012		FTE	RATIO TO FACULTY
	FT	**PT**			**FT**	**PT**		
Administrative					1	0	1	
Faculty (tenure-track)	21		21		17	0	17	
Other Faculty (excluding Student Assistants)					1	22	12	
Student Teaching Assistants (excludes institutional fellowships)		6	3.0			7		
Student Research Assistants						23		
Technicians/Specialists	4		4	0.25	3	0	3	
Office/Clerical Employees	2		2	0.13	2	0	2	
Others (Research Associates)					0	0	0	
Advisors								
Undergraduate Student Enrollment (Lower / Upper / All)	173/155/328	34/40/74	336		163/190/353	34/53/87	370	
Master's Student Enrollment	49		28		59		31	
Doctoral Student Enrollment (GC / GSOE / All)	21/10/31		29		2/28/30		23	

Table D-5. Program Fall Enrollment and Academic Year Degree Data
sources: CUNY IR database, SIMS and Grad. Center

School of Engineering

Academic Year	Class Standing					Total Undergrad	Master	Doctoral	Degrees Conferred		
	FT 1st	FT 2nd	FT 3rd	FT 4th	PT ALL				Bachelor	Master	Doctor
2012-2013	459	360	393	468	487	2167	408	178/226	n.a.	n.a.	n.a.
2011-2012	520	349	335	444	558	2206	445	151/234	251	134	31
2010-2011	500	411	401	383	436	2131	460	117/222	261	144	32
2009-2010	490	413	348	358	416	2025	425	69/211	283	142	27
2008-2009	479	351	344	354	383	1911	424	27/205	249	183	24
2007-2008	423	360	362	373	405	1923	515	0/194+csc	291	137	33
2006-2007	435	387	361	318	443	1944	405	0/202+csc	225	155	21
2005-2006	699	454	343	311	530	2337	429	0/193+csc	204	141	27
2004-2005	716	431	347	336	541	2371	433	0/201+csc	248	162	23
2003-2004	641	413	331	354	521	2260	448	0/192+csc	205	147	13

Masters enrollment excl. walk-in graduates. Doctoral enrollment: GSOE/Total, incl. Computer Science at Grad Center.

Biomedical Engineering

Academic Year	Class Standing					Total Undergrad	Master	Doctoral	Degrees Conferred		
	FT 1st	FT 2nd	FT 3rd	FT 4th	PT ALL				Bachelor	Master	Doctor
'2012-2013	67	36	37	51	23	214	27	34/40	n.a.	n.a.	n.a.
2011-2012	52	36	35	39	26	188	38	26/39	17	14	3
2010-2011	46	44	36	35	15	176	40	21/34	23	11	5
2009-2010	44	37	24	24	12	141	33	10/31	10	11	4
2008-2009	50	30	20	28	11	139	30	5/34	19	15	5
2007-2008	42	19	28	38	9	136	22	0/33	28	5	2
2006-2007	30	29	37	17	15	128	21	0/32	13	12	0
2005-2006	47	41	21	16	15	140	18	0/30	10	3	2
2004-2005	52	30	19	0	8	109	25	0/34	0	4	0
2003-2004	29	21	3	0	0	53	23	0/30	0	6	0

Chemical Engineering

Academic Year	Class Standing					Total Undergrad	Master	Doctoral	Degrees Conferred		
	FT 1st	FT 2nd	FT 3rd	FT 4th	PT ALL				Bachelor	Master	Doctor
2012-2013	32	29	41	48	26	176	8	39/43	n.a.	n.a.	n.a.
2011-2012	30	31	33	35	34	163	10	34/40	24	6	7
2010-2011	30	32	35	44	30	171	24	25/40	36	10	5
2009-2010	30	26	37	37	21	151	32	13/30	20	12	5
2008-2009	26	27	35	22	21	131	32	6/31	14	10	5
2007-2008	29	32	25	30	16	132	27	0/32	27	6	7
2006-2007	24	20	26	34	17	121	16	0/35	28	8	3
2005-2006	30	27	33	20	26	136	14	0/33	12	10	4
2004-2005	27	30	31	15	21	124	21	0/30	13	14	7
2003-2004	23	23	15	21	20	102	22	0/30	16	7	2

Civil Engineering

Academic Year	Class Standing					Total Undergrad	Master	Doctoral	Degrees Conferred		
	FT 1st	FT 2nd	FT 3rd	FT 4th	PT ALL				Bachelor	Master	Doctor
2012-2013	87	62	61	61	116	387	128	33/35	n.a.	n.a.	n.a.
2011-2012	103	58	56	68	127	412	118	23/32	28	24	7
2010-2011	104	84	67	57	104	416	113	18/30	24	27	5
2009-2010	84	90	60	53	99	386	91	12/31	44	22	1
2008-2009	88	69	52	37	96	342	82	6/27	21	21	2
2007-2008	81	66	74	44	99	364	75	0/26	34	17	2
2006-2007	77	83	60	42	86	348	71	0/24	15	14	6
2005-2006	110	70	56	40	90	366	77	0/25	16	17	4
2004-2005	103	65	48	40	82	338	100	0/26	28	20	3
2003-2004	96	46	40	39	73	294	101	0/22	20	21	2

Computer Engineering

Academic Year	Class Standing					Total Undergrad	Master	Degrees Conferred		
	FT 1st	FT 2nd	FT 3rd	FT 4th	PT ALL			Bachelor	Master	Doctor
2012-2013	70	41	35	35	53	234	0	n.a.	0	0
2011-2012	85	31	33	47	48	244	0	22	0	0
2010-2011	77	37	37	29	49	229	0	17	0	0
2009-2010	74	51	40	25	47	237	0	23	0	0
2008-2009	79	49	20	34	37	219	0	23	0	0
2007-2008	70	34	37	40	38	219	0	27	0	0
2006-2007	71	53	27	43	57	251	0	26	0	0
2005-2006	154	72	46	42	85	399	0	23	0	0
2004-2005	162	76	38	39	80	395	0	17	0	0
2003-2004	142	52	39	19	54	306	0	9	0	0

Computer Science

Academic Year	Class Standing					Total Undergrad	Master*	Doctoral	Degrees Conferred		
	FT 1st	FT 2nd	FT 3rd	FT 4th	PT ALL				Bachelor	Master	Doctor
2012-2013	47	31	34	32	51	195	99	25	n.a.	n.a.	n.a.
2011-2012	36	29	24	37	57	183	114	21	30	22	0
2010-2011	36	34	37	29	42	178	100	21	17	35	2
2009-2010	53	31	33	27	36	180	112	n.a.	28	41	0
2008-2009	42	33	28	24	46	173	122	18	19	60	1
2007-2008	38	33	27	38	50	186	170	n.a.	33	48	3
2006-2007	52	23	29	33	63	200	134	n.a.	20	51	1
2005-2006	88	50	50	41	99	328	139	n.a.	49	39	1
2004-2005	107	80	69	90	118	464	119	n.a.	76	52	2
2003-2004	143	117	106	112	155	633	123	n.a.	66	46	1

* incl. Master in Information Systems from AY 2009-2010 and later. Doctoral: at GSOE only.

Electrical Engineering

Academic Year	Class Standing					Total Undergrad	Master	Doctoral	Degrees Conferred		
	FT 1st	FT 2nd	FT 3rd	FT 4th	PT ALL				Bachelor	Master	Doctor
2012-2013	67	66	76	122	115	446	88	44/55	n.a.	n.a.	n.a.
2011-2012	84	73	79	111	129	476	98	38/64	71	43	10
2010-2011	88	83	102	96	121	490	118	31/75	75	39	10
2009-2010	98	95	79	97	116	485	108	21/73	87	38	11
2008-2009	115	73	107	104	101	500	109	7/68	87	52	6
2007-2008	90	106	79	102	114	491	150	0/77	81	30	17
2006-2007	106	90	103	91	128	518	99	0/91	76	45	10
2005-2006	143	104	91	100	128	566	118	0/85	62	54	10
2004-2005	137	87	90	98	130	542	115	0/90	68	53	8
2003-2004	106	103	82	109	132	532	114	0/97	66	35	4

Earth System Science and Environmental Engineering

Academic Year	Class Standing					Total Undergrad	Total Grad	Degrees Conferred		
	FT 1st	FT 2nd	FT 3rd	FT 4th	PT ALL			Bachelor	Master	Doctor
2012-2013	7	14	16	22	16	75	0	n.a.	n.a.	n.a.
2011-2012	18	12	10	19	18	77	0	6	0	0
2010-2011	14	15	14	11	9	63	0	8	0	0
2009-2010	13	4	4	11	11	43	0	9	0	0
2008-2009	7	3	9	12	3	34	0	4	0	0
2007-2008	8	2	7	7	5	29	0	7	0	0
2006-2007	1	4	6	4	2	17	0	0	0	0
2005-2006	0	0	0	0	0	0	0	0	0	0
2004-2005	0	0	0	0	0	0	0	0	0	0
2003-2004	0	0	0	0	0	0	0	0	0	0

Mechanical Engineering

Academic Year	Class Standing					Total Undergrad	Master	Doctoral	Degrees Conferred		
	FT 1st	FT 2nd	FT 3rd	FT 4th	PT ALL				Bachelor	Master	Doctor
2012-2013	82	81	93	97	87	440	59	28/30	n.a.	n.a.	n.a.
2011-2012	112	79	65	88	119	463	67	29/37	52	24	4
2010-2011	105	82	73	82	66	408	65	21/31	62	15	4
2009-2010	94	79	71	84	74	402	49	10/25	63	18	6
2008-2009	72	67	73	93	68	373	49	2/26	60	26	5
2007-2008	65	68	85	74	74	366	71	0/26	45	32	2
2006-2007	74	85	73	54	75	361	64	0/24	44	26	1
2005-2006	127	90	46	52	87	402	64	0/26	33	18	6
2004-2005	128	63	52	54	102	399	58	0/32	39	19	3
2003-2004	102	51	46	54	87	340	72	0/28	26	32	4

Table D-6. Faculty Salary Data[1]

Comment [AA9]: (add 2011-2012 data - probably not much change)

A. Institution as a Whole 2008-2009 *

	Clinical Med. Prof.	Non-clinical Med. Prof.	Professor	Associate Professor	Assistant Professor	Instructor
Number	10		195	141	133	35
High	167,800		$214,776	$104,760	$91,079	$62,665
Mean	$126,355		$137,710	$80,041	$69,010	$52,528
Low	$94,754		$72,181	$69,003	$47,181	$42,390

* Institutional salary follows the scale as established through PSC/CUNY collective bargaining unit.

B. School of Engineering as a Whole 2009-2010*

	Clinical Med. Prof.	Non-clinical Med. Prof.	Professor (Inc.Dist. Prof)	Associate Professor	Assistant Professor	Instructor
Number	0	0	64	28	21	0
Average	-	-	$122,946	$89,917	$78,176	-
Max	-	-	$214,776	$104,740	$91,079	-
Min	-	-	$99,274	$79,902	$71,974	-

* Include Deans and department chairs holding academic rank. These need not be specifically identified.

C. Departmental Salaries (2009-2010)

BME	Professor (inc. Distinguished)	Associate	Assistant	Instructor
Average	$150,744	$94,755	$81,645	
Number	4	6	1	
Max	$192,001	$96,635	$81,645	
Min	$116,364	$85,356	$81,645	

ChE	Professor (inc. Distinguished)	Associate	Assistant	Instructor
Average	$124,606	$111,129	$89,060	
Number	11	1	3	
Max.	$214,776	$111,129	$93,892	
Min.	$98,431	$111,129	$81,645	

CE	Professor (inc. Distinguished)	Associate	Assistant	Instructor
Average	$132,665.29	$96,635	$80,706	
Number	10	1	8	
Max	$170,731	$96,635	$81,645	
Min	$116,364	$96,635	$74,133	

[1] Also support through other departments. Refer to expenditure tables specific to each of the participating departments

CSc	Professor (inc. Distinguished)	Associate	Assistant	Instructor
Average	$116,823	$93,554	$85,393	
Number	11	8	4	
Max	$145,818	$91,635	$96,635	
Min	$102,253	$88,418	$81,645	

CPE	Professor (inc. Distinguished)	Associate	Assistant	Instructor
Average	$117,250	$93,348	$81,645	
Number	10*	5*	1*	
Max	$145,818	$96,635	$81,865	
Min	$101,071	$88,418	$81,645	

* Faculty from CSc & EE Dept.

EE	Professor (inc. Distinguished)	Associate	Assistant	Instructor
Average	$120,970	$91,761	$81,645	
Number	15	8	3	
Max	$174,468	$96,635	$81,645	
Min	$106,071	$85,356	$81,645	

ENV	Professor (inc. Distinguished)	Associate	Assistant	Instructor
Average	$124,714	$90,646	$81,645	
Number	12*	6*	1*	
Max	$170,731	$96,635	$81,645	
Min	$98,431	$85,356	$81,645	

* Faculty from ChE, CE, CSc, & EE Departments & Science Division.

ME	Professor (inc. Distinguished)	Associate	Assistant	Instructor
Average	$127,020	$95,165	$81,645	
Number	15	4	2	
Max	$185,864	$96.656	$81,645	
Min	$109,674	$90,756	$81,645	

CHART 1. Organization Chart of the Grove School of Engineering

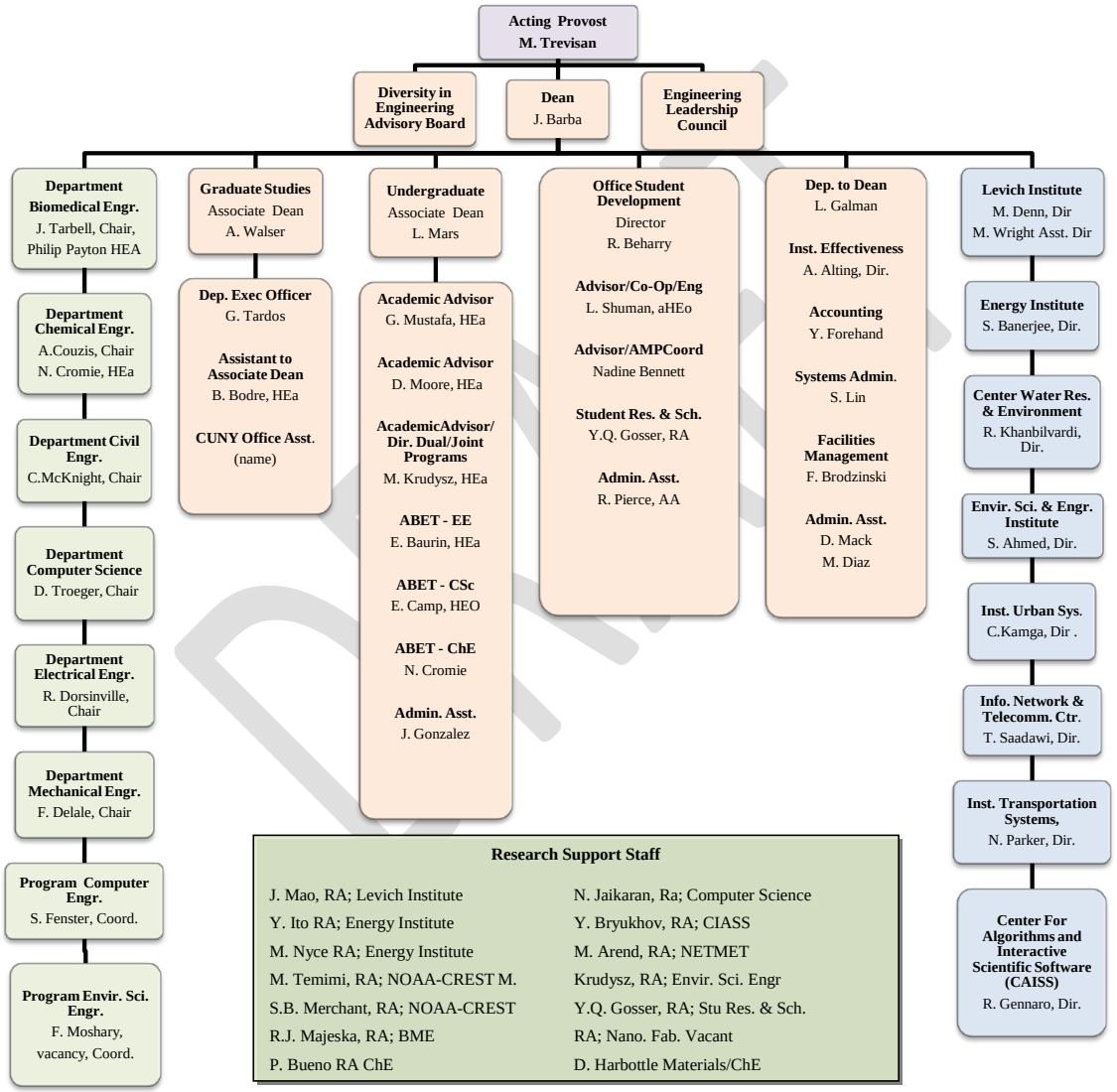

CHART 2. List of Supporting Departments

Comment [AA10]: update 2012 situation

Department or Unit	1 Full-Time Head Count	2 Part-time Faculty Head Count	3 FTE Faculty	Teaching Assistants		Average Section Sizes		
				Head Count	FTE*	6 Lecture	7 Lab	8 Recitation
Department of Chemistry	23	12		10		25		
Department of Computer Science	24	5		3		25		
Department of English	29	88				23		
Department of Mathematics	23	34				27		
Department of Physics	26	17		8		25		
Department of Biology								

In column 1 give the number of full-time faculty members (tenure track plus other teaching faculty, as classified in Table II-1) exclusive of teaching assistants.

In column 2 give the number of part-time, adjunct, or visiting teaching faculty members, exclusive of teaching assistants.

In column 3 give the sum of column 1 plus FTE* of column 2.

APPENDIX E - ACADEMIC ASSESSMENT SUMMARY AND REPORTS

The Grove School of Engineering is engaged in a continuous and rigorous process of program review, including academic assessment of its eight undergraduate programs in Biomedical Engineering, Chemical Engineering, Civil Engineering, Computer Engineering,Computer Science, Electrical Engineering, Earth Systems Science and Environmental Engineering, and Mechanical Engineering. All undergraduate programs underwent ABET accreditation in fall 2010 and obtained full accreditation until the next visit in fall 2016. Therefore, in this report we focus on academic assessment of our graduate programs.

Master's programs:
The Grove School of Engineering has Master's programs in Biomedical, Chemical, Civil, Electrical and Mechanical Engineering, Computer Science, and Information Systems. In spring 2013, there is also a small number of students enrolled in Advanced Certificate programs in Chemical Engineering (2), Civil Engineering (1) and Engineering Management (1).

Ph.D. programs:
Since fall 2008 the Ph.D. programs in engineering, formerly offered through the CUNY Graduate Center, are being offered at CCNY. The five Ph.D. programs are: Biomedical, Chemical, Civil, Electrcial and Mechanical Engineering.

In Fall 2012, the Dean of Graduate studies retired and was succeeded by prof. A. Walser (acting), formerly Dean of Undergraduate Affairs. He met with departmental representatives and identified a number of challenges and possible solutions.

Summary of the Departmental Assessment Activities and Use of the Findings

All Ph.D. and Master's programs in Engineering have Program Learning Outcomes (PLOs) aligned with their departmental Missions and the Mission of the Grove School of Engineering. They completed Curriculum Grids in which courses and other learning activities are aligned with the PLOs. Since the spring of 2011, all Ph.D. students, whether enrolled at the CUNY Graduate Center or at CCNY, were assessed continuously when they took the second exam (proposal) and third exam (thesis & defense), by a panel of three to seven experts in the field, often including outside evaluators. Some of the programs also assessed the Qualifying Exam.

The Electrical Engineering department has implemented a progress review similar to a personnel evaluation each semester for their doctoral students, to determine achievement of goals and collect feedback from their students. The Biomedical Engineering program also plans to implement (as of fall 2013) a progress review using the learning outcomes assessment tools ("Exam Forms") as guidelines to focus the discussion.

The new (acting) Dean of the Office of Graduate Studies is reviewing admissions, advising and funding policies with the department chairs and coordinators for the graduate programs (Ph.D. and Master's). The data are collected, analyzed and reported by the GSOE Office of Assessment and Institutional Studies and the GSOE Office of Graduate Studies.

The Master's PLOs are assessed with course embedded assessments, by aligning assignments, projects and exam questions with the course learning outcomes (CLOs) which in turn are aligned with the PLOs. The Master's programs have started this activity and at present, have assessed two to six courses each. The plan is to assess a number of courses each semester such that after two to three years all courses have been assessed and a complete program assessment can be performed by aggregating the data.

The instructors who assessed their courses made changes where appropriate (e.g., change emphasis on topics in class and homework assignments).

The Master's programs also provide the coursework for the first phase of the Ph.D. program. Many doctoral students transfer in their coursework however, therefore Ph.D. program outcomes are assessed through the exams in the doctoral phase.

Indirect measures used as of now are retention and graduation rates in all Ph.D. programs and selected Master's programs (BME and CSc), student surveys on achievement of CLOs (CE), academic standing in the Master's program (ChE) and study progress including student reflections in the progress reviews with students (EE).

The findings until now are reported in the attached assessment reports and plans.

Challenges

There are challenges within and outside of the PhD program from funding, to advising, to the development of a common culture between the five distinct programs.

Funding or the lack of funding at a more appropriate and sustainable level is the biggest challenge to date, along with a less than ideal level of support staff for managing the graduate programs (Ph.D. and Masters). We have already begun addressing some of the advising challenges such as keeping a closer watch on the progress of Ph.D. candidates through the program.

To address the funding problems, Deans Barba and Walser attended a meeting arranged by VP Posman with CUNY Associate Vice Chancellor for Budget and Finance Matthew Sapienza regarding the Ph.D. programs, early January 2013. The Deans argued for parity for the engineering Ph.D. funding with the CUNY Science Ph.D. programs. The Deans were able to produce many supporting documents that this was the intention at the time of the transfer of the Ph.D. programs in Engineering from the Graduate Center to CCNY in fall 2008. However, this meeting confirmed that the College administration did not follow through on the (ongoing in November 2009) negotiations with CUNY needed to establish the funding model. The program is now $1.3 million in debt, a level that is unsustainable. Discussions are ongoing.

Activities and Further Plans for Improvement

The Graduate Office is working with department chairs, Ph.D. advisors and Ph.D. mentors on developing ways that the five programs can take advantage of each others experiences and share best practices. The acting dean of Graduate Affairs (Walser) recently met with the Ph.D. advisors (in Structures, Transportation, and Water Resources) for Civil Engineering (CE) to discuss the process for admission to the three different Ph.D. concentrations in CE. The main topics of discussion were based on specific cases and are as follows:

1. Admission to Ph.D. (CE) - Developing a consistent protocol for responding to students seeking admission to the CE Ph.D. who do not have a CE degree or background.
    a. Possible solutions:
        i Establishing appropriate and executable conditions for admission to the Ph.D. (CE) program such as the number and types of undergraduate courses.
        ii. Limiting the number of required undergraduate courses so that the student is able to complete them in one year or require that all undergraduate courses be completed before taking graduate courses.
2. Establishment of a protocol for course evaluation and transfer for students with graduate courses from disciplines other than traditional engineering or STEM areas.

Reports

The following five reports describe more in detail what each department has done in academic assessment of their master's and doctoral programs. It should be noted that the doctoral program in Computer Science is administered through the CUNY Graduate Center and falls under the Middle States accreditation of the Graduate Center. Reviewers are welcome to request any additional information they may need.

Grove School of Engineering
Assessment Plan & Reports for Graduate Programs in Engineering
2011-2013

Department: Biomedical Engineering
Department representative: Schaffler, Parra
Chair's signature:
Date Submitted: 4/10/13

Attach the Course vs. Program Outcomes Curriculum Matrices (Master's and PhD if applicable) to this report.
Please answer all questions and make sure you can substantiate claims with documentation.

Assessment Report Academic Year 2011-2012

1. Please check your assessment activities in and before 2011-2012 and submit this page to Annita Alting, director of Institutional Effectiveness, Rm. T137 (Dean's Office) by June 22, 2012.

Activity	*Check*
Reviewed / developed program learning outcomes (PhD)	*x*
Reviewed / developed program learning outcomes (Master's)	*x*
Developed Curriculum Matrix / Map (PhD)	*x*
Developed Curriculum Matrix / Map (Master's)	*x*
Developed assessment tools for Doctoral assessment	*x*
Developed assessment tools for Master's assessment	*x*
Reviewed / developed course learning outcomes and included them on syllabi	*partial*
Collected assessment data (PhD)	*x*
Collected assessment data (Masters)	*x*
Analyzed and discussed assessment data (PhD)	*x*
Analyzed and discussed assessment data (Master's)	*x*
Other:reviewed assessment approaches with director of inst. effectiveness in meetings	*x*

Use of assessment data for improvement in 2011-2012:	***Check***
a. We made changes in course content	
b. We made changes in course delivery and/or pedagogy	
c. We added and/or deleted courses	
d. We made changes in pre / co-requisites	
e1. We made changes in degree requirements (PhD)	
e2. We made changes in degree requirements (Master's)	
f. We made changes in the emphasis for new / vacant faculty positions	
h. We included assessment results in faculty meetings / retreats, curriculum committee meetings, etc.	
i. We made changes in degree programs and the development of new degree program options	
j. We were able to justify past curriculum changes and show program improvement resulting from those changes	
k. We made changes in the advising processes	
l. We developed academic services for students	
m. We developed new career explorations and/or career services for students	
n. We made changes to student academic facilities such as labs and study areas	
o. We developed / improved academic and program information to students	*x*
p. We shared assessment information with alumni and review/advising boards	
q. We further refined the assessment methods or implemented new assessment methods	*x*

r. We made chamges in instucttional / mentoring emphasis for current faculty
s. We changed our admissions criteria
t. Other:

Assessment Plan Academic Year 2012-2013

Department: Biomedical Engineering
Department representative: Schaffler, Parra
Chair's signature:
Date Submitted: 4/10/13

Please answer all questions and submit this plan to Annita Alting, Rm T137 (Dean's Office) by October 15, 2012.

1. Which Program Learning Outcome(s) do you plan to assess in 2012-2013? List Below:
2. Check all the assessment methods you plan to employ in 2012-2013 and the semester in which you will collect the data:

Direct Methods	***Fall 2012***	***Spring 2013***
PhD Qualifying Exam		
PhD Proposal	*x*	*x*
PhD Dissertation & Defense	*x*	*x*
Master's Thesis or Other Capstone Experience		*x*
Course-embedded assessment of Program Learning Outcome(s)	*x (master's)*	*x (master's)*
Lab reports		
Other Method:		

Indirect Methods	***Fall 2012***	***Spring 2013***
Student Course Survey		
Progress Review Form (PhD)		*x*
Exit Survey or Interview		
Student-Faculty Mixer(s)		
Focus Group		
PhD program acceptance rates	*x (GSOE wide)*	
Job placements		
Alumni Feedback		
Employer Feedback		
Grade Analyses / Course or Exam Pass Rates		
Retention and Graduation Analyses	*x*	
Enrollment analysis (e.g., effect of admissions criteria)		
Other Method:Semesterly meetings with all students		*x*

3. Have you discussed your plans with the instructors of the courses that will be assessed? ***Yes***
4. List the faculty members and/or departmental committee(s) who will participate in assessing the data:

- ***BME Graduate Curriculum Committee***
- ***Professor Lucas Parra (Master's Program Coordinator)***
- ***Distinguished Professor Mitchell Schaffler (Doctoral Progam Coordinator)***
- ***Professor Simon Kelly - Course: Neural Systems & Behavior***
- ***Professor Steven Nicoll - Course: Advanced Biomaterials***
- ***Professor Maribel Vazquez - Course: Microfluidic Devices***
- ***Professor Sihong Wong - Course: Laboratory in Cellular and Molecular Engineering***

5. When will data collected in the Fall 2012 be analyzed? ***Spring 2013***
6. When will data collected in the Spring 2013 be analyzed? ***After finals of spring 2013***
7. Who will write the 2012-2013 assessment report? ***PhD and Master's coordinators, faculty in courses being assessed and dir. of Inst.***

Effectiveness.
8. When will the report be shared with stakeholders? ***Edn of April 2013.***

9. Other comments:

Assessment Report Academic Year 2012-2013- Interim for PRR

Department: Biomedical Engineering
Department representative: Schaffler, Parra
Chair's signature: Ann Tabell
Date Submitted: 4/10/13 March 15, 2013 (interim)

Please answer all questions and submit this report to Annita Alting, Rm T137 (Dean's Office) by October 15, 2013. (For 2013 only: please provide interim report on the questions below by March 15, 2013, to Annita Alting, T137, for inclusion in Middle States Periodic Review Report due June 1, 2013)

I. Program Learning Outcomes (PLOs)

a. Which Program Learning Outcome(s) did you assess in 2012-13? List below or refer to the plan 2012-2013.

- Masters Program / PhD level 1 (Fall 2012):
- Gain exposure to biological and physiological problems and concepts so that existing skills can be applied in a biomedical context
- Develop analytic skills and the ability to critically evaluate relevant scientific literature.
- Develop ability to effectively present technical material, orally and in writing in an advanced research context.
- Establish core technical know-how and practical skills in biomedical and engineering disciplines.

PhD Program (Fall 2011-Fall 2012): See the attached Activities vs. Outcomes Grid

b. How many PLOs have you assessed since this process began in Spring 2011?
List all below, including repeats:
Masters program / PhD level 1: See above - Direct assessment started in Fall 2012, after a period of preparation
PhD progam: All PLOs have been assessed on an ongoing basis since spring 2011.

c. How much data was collected for this report?
Master's Program / PhD level 1: During Fall 2012, four courses were assessed on the course learning outcomes related to the program outcomes mentioned under I.a., two lecture-based courses and two lab courses. Participation ranged from 14 to 20 students per course. Courses are attended by both Master's and PhD students and on occasion advanced undergraduate students with permission to take a Master's level course. Some courses are also taken by students from other Engineering majors. Assignments and/or exam questions were aligned with the course learning outcomes and graded to obtain a class average for each course learning outcome.
Doctoral Program: All students taking the second exam (proposal) and third exam (dissertation & defense) were evaluated using "exam forms" on which the evaluators scored the candidate on each of the learning outcomes for the exam. Over the period Spring 2011-Spring 2013, eight students submitted the proposal and seven students submitted and defended their thesis.

d. What DIRECT EVIDENCE of student learning did you evaluate? Direct evidence refers to student work: essays, exams, presentations, performances, exhibitions, internships, portfolios, etc. (Please attach any rubrics or other evaluative tools.)

Course / Exam	**N students (Masters/PhD)**	**Direct evidence**
BME G3200: Neural Systems and Behavior (Kelly)	20 (12/5)*	Quizes, selected questions on final exam, home project, homework assignments
BME G6000: Advanced Biomaterials (Nicoll)	20 (11/9)	Homework assignments, class presentation, term paper
BME I7700: Microfluidic devices (Vazquez)	18** (6/12)	Lab exercises and written report, Design poster presentation
BME I7000: Laboratory in Cellular and Molecular Engineering (Wang)	14 (6/7)***	Individual and Group lab assignments
PhD Proposal	8	Written Proposal and presentation to a panel of experts in the field
PhD Dissertation / Defense	7	Written thesis and presentation to committee of experts in the field

* 3 undergraduate seniors, ** 1 Master's and 9 PhD students in Chemical Engineering included, 1 undergr. senior, 1 Mech. and 1 Chem. engr. PhD.

e. Was your rubric for evaluating this material reliable? That is, were the scores relatively consistent for each trait among faculty evaluators?
The coursework was evaluated by the instructor using standard grading techniques for the outcome-related assignments and exam questions. Beforehand, the instructor decided on a target (expected grade demonstrating proficiency - either the percentage of students scoring higher than a certain minimum grade and/or a minimum average class grade, for each learning outcome). Since there was only one evaluator, consistency between evaluators was not determined.

The PhD proposals and dissertation & defense were evaluated by four to five evaluators per student and in this case consistency could be determined. The proposal showed generally consistent scoring, except for the evaluation of the abiltity to write a successful research proposal, where three out of seven students had evaluations differing two or more points between evaluators. The outcome is probably formulated too broadly, encompassing skills that should be evaluated independently, e.g., clarity and comprehensiveness. The dissertation & defense outcomes were also scored fairly consistently, except outcome 5, with four out of seven students receiving evaluations differing two or more points between evaluators. Outcome five addressed the quality of writing and chapter layout.

f. What are your findings from direct evidence? How do they compare to earlier evaluations of direct evidence?
Since there were no earlier evaluations, comparisons with earlier evaluations cannot be made yet.

Course / Exam	Findings	Analysis and Follow-up
BME G3200: Neural Systems and Behavior (Kelly)	Three of the five learning outcomes showed a mean class grade that was slightly lower than the target, which was set at 82.5 (B+). The two remaining course outcomes met the target.	The instructor taught the course for the first time. His analysis and ideas for follow-up: Including Outcome 4 might be a bit ambitious given the focus of the course on psychophysics and modeling. It is indeed a necessary part of the class, because they need introductions to techniques in order to comprehend some of the literature covered. However, proficiency might be too much to expect. I will not drop the outcome for now, and will reconsider the issue after I have taught the course a second time. I wish to add a 6th learning outcome that naturally arose as an important one over the course of this first teaching of the course: - 6. develop the ability to comprehend and critique experimental design issues. This was assessed through all of the above methods: quizzes, a homework programming assignment and the final exam, and the average score worked out at 82.2, my target score indicating proficiency.
BME G6000: Advanced Biomaterials (Nicoll)	All five learning outcomes showed mean class grades demonstrating proficiency. The target was set at B+/A- for the mean.	No changes are necessary for now.
BME I7700: Microfluidic devices (Vazquez)	Two out of 18 students did not meet the target score of 90% on lab exercises and written report. Only 6 out of 18 students met the target score of 90% on the design poster presentation.	Still to be determined. Course content changes rapidly as new technology evolves.
BME I7000: Laboratory in Cellular and Molecular Engineering (Wang)	Conclusion, as individuals 43% of them met the expectation. One of the four groups did not meet the expected proficiency level as a group.	Fewer students in each group will force more students to learn the experimental protocol design independently during each lab practices. Since the groups were 3 to 4 students, this means creating pairs of students to work on the assignments next time around.
PhD Proposal	Student scores ranged from (less than) adequate to excellent on outcomes 1 to 3, and from weak to near excellent on outcome 4. The writing outcome showed some inconsistent scoring between evaluators of the same student. On each learning outcome, five out of eight students (63%) scored '"4" or higher. Three out of eight students scored lower than 3.5 on two or more of the four outcomes.	The "writing" outcome should be formulated more clearly. Targets still need to be decided, for the average of each learning outcome across students, and for the percentage of students meeting each learning outcome at the desired level. Based on comments provided by evaluators on the scoring forms, a score of 3 (adequate) should often be interpreted as "barely passing". A target for each learning outcome could be 80% of students scoring "4" or higher, and all scores higher than 3.0. A target for each student could be no more than one learning outcome with a score lower than 3.50.
PhD Dissertation / Defense	All students received an average score of "fairly good" to "excellent" on all 9 learning outcomes.The writing outcome showed some inconsistent scoring between evaluators of the same student. On four learning outcomes (1,2,4,7) all students scored "4" or higher, on three learning outcomes (3,6,8), six students (86%) scored "4" or higher, and on two outcomes (5,9) five students (71%) scored '4" or higher. There were no students with more than one score lower than 3.50 on the nine	The "writing" outcome should be formulated more clearly. Targets still need to be decided, for the average of each learning outcome across students, and for the percentage of students meeting each learning outcome at the desired level. A target for each learning outcome could be 80% of students scoring "4" or higher, and all scores higher than 3.0. A target for each student could be no more than two learning outcomes with a score lower than 3.50.

learning outcomes.

g. What INDIRECT EVIDENCE did you use? Indirect evidence includes students' reflections on their own learning in the form of surveys, questionnaires, focus groups, and one-minute essays as well as other evidence, such as admission rates to graduate programs, career placement rates, voluntary gifts from alumni, etc. (Please attach surveys, focus group or essay questions, etc.)

A first analysis of retention of PhD students starting at CCNY since fall 2008 though fall 2012, shows that none of the 33 students had left the program as of fall 2012, one had obtained the PhD degree and all were in good academic standing (Cum. GPA 3.00 or higher).

The PhD coordinator, prof. Schaffler, is creating a system for twice a year progress meetings with all PhD students to diagnose lack of progress early on. The plan is to use the exam forms to organize discussion and provide direction for advising students. The meetings will provide additional indirect evidence in the future.

MS students meet with the MS advisor each semester to determine their progress and to assure that they are placed in a timely fashion in a research lab to perform their Thesis or Project. A common problem is a delay of the MS thesis, and therefore students are carefully monitored on their progress. In addition MS student expressed an interest in more flexible course requirements to permit a more narrow specialization for potential job opportunities. Thus We made course selection for MS degree more flexible to permit specialization as desired.

We plan to perform a similar analysis of retention and academic standing for the Master's students. Courses feedback is identical to the PhD program as all graduate students take the same courses.

h. What are your findings from indirect evidence? How do they compare to earlier results?

See the above.

II. Course Learning Outcomes

a. What percentage of full-time faculty members complied with your request to submit syllabi with Course Learning Outcomes (CLOs) in the spring of 2013?

Faculty provided syllabi for 18 out of the 20 courses in the BME graduate curriculum taught by BME department. Analysis of the syllabi on course learning outcomes is in progress. Course learning outcomes for Fall 2012 (4 courses) were completed.

b. What was the annual (2012-13) percentage of compliance?

Compliance is at 90%.

c. Are faculty proficient in composing CLOs? Are they able to align their CLOs with the PLOs? If not, how do you plan to address issues of faculty compliance and competence in this area?

Because of their experience with ABET, all faculty know how to compose CLOs and align CLOs with the PLOs. Graduate committee will meet with the Faculty of the Fall 2012 courses and evaluate the need for modifications in these courses, based on the assessed outcomes. Principal emphasis will be on new courses offered for the first time. The BME faculty has generally been very open to suggestions and advice on assessment matters.

III. 2012-13 Assessment Plan vs. 2012-13 Assessment Report

a. Have you deviated from the 2012-13 Assessment Plan? If so, how—and why?

No.

IV. Recommendations and Actions

a. When will you share the 2012-13 assessment report with stakeholders? What opportunities will you or your Chair provide for faculty to discuss the findings?

The report may be shared with stakeholders after it has been discussed in the regular meetings of faculty and curriculum committee. This interim report has been provided as evidence for the PRR 2013.

b. Are you piloting any new courses or proposing any curricular changes, minor or major, based on your assessment thus far? If so, please describe and fill out the checklist below.

Use of assessment data for improvement in 2012-2013:	***Check***
a. We made changes in course content	
b. We made changes in course delivery and/or pedagogy	
c. We added and/or deleted courses	
d. We made changes in pre / co-requisites	
e1. We made changes in degree requirements (PhD)	
e2. We made changes in degree requirements (Master's) (see section 1G above)	*x*
f. We made changes in the emphasis for new / vacant faculty positions	
h. We included assessment results in faculty meetings / retreats, curriculum committee meetings, etc.	
i. We made changes in degree programs and the development of new degree program options	
j. We were able to justify past curriculum changes and show program improvement resulting from those changes	
k. We made changes in the advising processes (see section 1G above)	*x*
l. We developed academic services for students	
m. We developed new career explorations and/or career services for students	
n. We made changes to student academic facilities such as labs and study areas	
o. We developed / improved academic and program information to students **(continuously update online program guidelines for curriculum and timelines)**	*x*
p. We shared assessment information with alumni and review/advising boards	
q. We further refined the assessment methods or implemented new assessment methods **ongoing process for all courses.**	*x*
r. We made chamges in instructional / mentoring emphasis for current faculty	
s. We changed our admissions criteria	
t. Other:	

A: Outcome is Assessed (Exam, Assignment, Presentation, Thesis). X: Opportunity to develop the ability / knowledge addressed in the learning outcome, F: Formative Evaluation of student progress & feedback to student for improvement

		PREVIOUS WORK / TESTS		DOCTORAL PROGRAM ACTIVITIES					
OBJECTIVE	**PROGRAM LEARNING OUTCOME**	**Master's work (at CCNY or transferring institution)**	**Standardized Tests (GRE, etc..)**	**BME I0000 Biomedical Engineering Seminars**	**1st exam**	**2nd exam**	**Thesis & Defense**	**Disserta-tion Super-vision**	**BME J9903 / J9906 / J9909 Disserta-tion Research**
A. Comprehension of the fundamentals of Biomedical Engineering as covered by an ABET accredited curriculum	1. The student is able to apply the fundamentals of Biomedical Engineering to solve new problems	X	(TBD)	(TBD)	A			F	X
B. Preparedness to Conduct Ph.D. level research	2. The student comprehends specific topics of current interest in Biomedical Engineering Research	X	(TBD)	(TBD)	A			F	X
	3. The student shows potential for conducting Ph.D. level research	X	(TBD)	(TBD)	A			F	X
C. Effective Communication Skills	4. The student is able to effectively present technical material to peers and faculty, orally and in writing	X		X	A	A	A	F	
D. Other, if applicable	5. Specification								
E. Ability to conduct a literature survey in order to identify and investigate a new research problem	1. The student has identified a new research topic for the Ph.D. degree			(TBD)	A	A		F	X
F. Competence in using the tools of research in the field	2. The student uses and applies such tools of research as are necessary to conduct research in the field (e.g., computer languages, novel experimental techniques, statistics, etc.,)			(TBD)		A		F	X
G. Evaluation, comparison and choice of appropriate method(s) of solution	3. The student has evaluated and compared several solution methodologies and chosen an appropriate approach			(TBD)		A		F	X
H. Ability to write a successful research proposal	4. The student has written a clear, comprehensive, and accurate proposal describing the planned research for the Ph.D. degree			(TBD)		A		F	X
I. Effective communication skills	5. The student is able to effectively present technical material to peers and faculty, orally and in writing			(TBD)		A		F	X
J. Statement of the problem	1. The problem clearly stated			(TBD)			A	F	X
	2. The student has provided a motivation for the work and a need for a solution.			(TBD)			A	F	X
	3. Is the title appropriate?			(TBD)			A	F	X

appendix doctoral achivies & outcomes

K. Survey of Previous and Related Work	4. Has the student analyzed previous and related work and provide the reasons for the proposed solution of the problem?		(TBD)		A	F	X
L. Objectives and Goals	5. Has the student defined the objectives and goals of the work?		(TBD)		A	F	X
	6. Are there measures of success to evaluate the work?		(TBD)		A	F	X
	7. Have the goals been achieved?		(TBD)		A	F	X
	8. Is there a comparison with existing similar work?		(TBD)		A	F	X
M. Solution	8. Is the solution provided technically sound?		(TBD)		A	F	X
	9. Does the solution confirm to professional standards?		(TBD)		A	F	X
	10. Is the solution novel?		(TBD)		A	F	X
	11. Does it (the solution) have other implications, tecnological or otherwise?		(TBD)		A	F	X
N. Quality of Writing and Chapter Layout	12. The dissertation is acceptable as is		(TBD)		A	F	X
	13. The dissertation is acceptable with minor revisions		(TBD)		A	F	X
	14. The dissertation is acceptable with major revisions		(TBD)		A	F	X
O. Bibliography	15. Is the list of references provided relevant to the work?		(TBD)		A	F	X
P. Oral Presentation	16. Did the student provide a well-prepared and clear oral overview of the work?		(TBD)		A	F	X
Q. Ability to Answer Questions	17. Did the student understand the questions and answer them in a satisfactory manner?		(TBD)		A	F	X
R. Publication Record	18. E.g., publication in peer-reviewed journal, at a conference, internal report, etc.,		(TBD)		A	F	X
S. Other, if applicable	19. Specification		(TBD)		A	F	X

appendix doctoral achivies & outcomes continued.

OBJECTIVES (The expected accomplishments of graduates from the Master's program): **The programs of course offerings at the master's level fulfill three vital current needs A, B and C (Bulletin 2008-2010):**					**A: To provide qualified engineering and non-engineering graduates with the opportunity to continue their professional training at an advanced level.**			**B: To provide graduates with a firm grounding in the theoretical foundations and advanced skills necessary to conduct cutting-edge research on biomedical problems in an academic or industry setting.**				
					LEARNING OUTCOMES (A)			LEARNING OUTCOMES (B)				
INSTRUCTIONS. Fill in an "X" if the course addresses / contributes to, the learning outcome. Fill in an "A" if the program outcome will be assessed in the course. Add the semester in which the assessment will take place. The assessment needs to be done based on student work (direct assessment), and on indirect assessment (e.g., grades, pass rates, surveys, focus groups, etc). Choose the assessments such that over a period of five years (coinciding with Middle States visit and PRR), all PLO's have been assessed, the results used for program improvement, and any improvements implemented. Document the results, e.g., externally in the GSOE annual reports, internally by office of assessment & institutional studies and department. Comprehensive theses or research reports or capstone courses are an excellent way to summatively evaluate program effectiveness on all learning outcomes.					Attain focus and depth in a specialized area of BME, and become an expert in that area.	Gain exposure to biological and physiological problems and concepts so that existing skills can be applied in a biomedical context	Gain practical experience and training in a research laboratory either at CCNY or at a clinical research center through the NYCBE.	Establish core didactic knowledge in biomedical and engineering subjects.	Establish core technical know-how and practical skills in biomedical and engineering disciplines.	Develop analytic skills and the ability to critically evaluate relevant scientific literature.	Develop skills in experimental design and data collection in a directed research setting using state-of-the-art engineering and biological approaches.	Develop ability to effectively present technical material, orally and in writing in an advanced research context
NUMBER	**TITLE**	**INSTRUCTOR**	**SEMESTER OFFERED**	**SYLLABUS** (with course learning outcomes)								
	ALUMNI SURVEY											
BME I0000	**SEMINAR: BMED ENGR**	WANG	FA, SP			**X**		**X**		**X**		
BME I9800	**PROJECT**	FACULTY	FA, SP		**X**	**X**	**X**		x	X	X	X
BME I9903, BME I9906	**THESIS RESEARCH**	FACULTY	FA, SP		**X**	X	X		x	X	X	X
BME I7100	**CELL & TISSUE MECH**	COWIN	FA	**Knowledge of he mechanical properties of hard and soft tissue are presented with emphasis on the stress adaptive processes that enable cells to adapt the mechanical/structural properties of tissues in which they live to the environment they experience. Applications to whole body biomechanics, occupational, sports and injury, impact biomechanics, tissue level biomechanics. The biomechanics of implants and cell biomechanics and their interrelationship explored. The mechanical properties of tissues, with an emphasis on the structure-function relationship. The stress adaptive mechanisms of tissues, with special emphasis on the stress adaptation observed in bone (Wolff's law) and in the arterial wall (Murray's law). The structural properties of cells, including their strength, deformability and adhesive properties, as well as the chemical adaptation of cell structural properties, cell receptors and cell-signaling mechanisms.**	**X**	**X**		**X**	**X**	**X**	**X**	**X**
BME I7300	**CEL-TIS BIOMAT INTR**	NICOLL	SP			**A, Sp 13**		**X**		**A, Sp 13**		**A, Sp 13**
BME I2000	**CELL & TISSUE ENGRN**	WANG	SP	X	**X**	**X**		**X**		**X**		**X**
BME I2200	**CELL & TISSUE TRNSP**	FU	FA		**X**	**X**		**X**		**X**		**X**
BME I5000	**MEDCL IMAG-IMAG PROC**	PARRA	SP		**X**	**X**		**X**	**X**			
BME I5100	**BIOMED SIGNAL PROC**	PARRA	FA		**X**	**X**		**X**	**X**			
BME I4300	**PHYSIOLOGY BMED ENGR**	CHAN	FA					x				
BME I3000	**NEUR ENG-APP BIOELEC**	BIKSON	FA, SP		**X**	**X**		**X**	**X**	**X**	**X**	**X**
BME G3200	**NEUR SYSTEMS BEHAV**	KELLY	FA	**Students will 1) acquire basic knowledge of sensory and cognitive neural systems, 2) learn the fundamentals of psychophysics and signal detection theory; 3) design and program a psychophysical task, and record and analyze the data; 4) gain a general knowledge of neural recording techniques and analyses; 5) learn to develop basic models of perceptual and cognitive processes**	**X**			**X**	**X**	**X**	**X**	
BME I7000	**LAB CEL&MOLECLAR ENG**	WANG, MAJESKA	FA	X		**X**		**X**	**X**		**X**	**X**

o matrix Masters Courses vs PLOS

OBJECTIVES (The expected accomplishments of graduates from the Master's program): **The programs of course offerings at the master's level fulfill three vital current needs A, B and C (Bulletin 2008-2010):**					**A: To provide qualified engineering and non-engineering graduates with the opportunity to continue their professional training at an advanced level.**			**B: To provide graduates with a firm grounding in the theoretical foundations and advanced skills necessary to conduct cutting-edge research on biomedical problems in an academic or industry setting.**				
					LEARNING OUTCOMES (A)			LEARNING OUTCOMES (B)				
INSTRUCTIONS. Fill in an "X" if the course addresses / contributes to, the learning outcome. Fill in an "A" if the program outcome will be assessed in the course. Add the semester in which the assessment will take place. The assessment needs to be done based on student work (direct assessment), and on indirect assessment (e.g., grades, pass rates, surveys, focus groups, etc). Choose the assessments such that over a period of five years (coinciding with Middle States visit and PRR), all PLO's have been assessed, the results used for program improvement, and any improvements implemented. Document the results, e.g., externally in the GSOE annual reports, internally by office of assessment & institutional studies and department. Comprehensive theses or research reports or capstone courses are an excellent way to summatively evaluate program effectiveness on all learning outcomes.					Attain focus and depth in a specialized area of BME, and become an expert in that area.	Gain exposure to biological and physiological problems and concepts so that existing skills can be applied in a biomedical context	Gain practical experience and training in a research laboratory either at CCNY or at a clinical research center through the NYCBE.	Establish core didactic knowledge in biomedical and engineering subjects.	Establish core technical know-how and practical skills in biomedical and engineering disciplines.	Develop analytic skills and the ability to critically evaluate relevant scientific literature.	Develop skills in experimental design and data collection in a directed research setting using state-of-the-art engineering and biological approaches.	Develop ability to effectively present technical material, orally and in writing in an advanced research context
NUMBER	**TITLE**	**INSTRUCTOR**	**SEMESTER OFFERED**	**SYLLABUS** (with course learning outcomes)								
BME I8000	**BONE PHYSIOLOGY & BIOMECHANICS**	SCHAFFLER	SP		X	X		X	X	X		X
BME I9000	**SK SOFT TIS BME/PHYS**	SCHAFFLER	SP		X	X		X	X	X		X
BME I7700	**MICROFLUIDIC DEV BIOTECH**	VAZQUEZ	FA			X	X	X			X	X
BME I4200	**ORGAN TRANSPORT & PHARMACOKINETICS**	FU			X	X		X	X	X		X
ENGR I7500	**POROELASTICITY**	COWIN	FA	**Biot poroelasticity is a model for interaction of stress and fluid flow in a porous medium incorporating elastic solid properties and Darcy's law. The Biot model is used to solve quasistatic problems containing creep, stress relaxation and consolidation as well as wave propagation problems, including the "second sound" prediction and verification. The Biot model is extended as a continuum mixture model suitable for a description of the mechano-electro-chemical behaviors associated with deformation and fluid flow in charged-hydrated porous materials. This mixture model provides a flexible and general basis that permits the development of a unified viewpoint for many diverse and simultaneously occurring phenomena.**	X	X		X	X	X		X
ENGR I4200	**CONTINUUM MECHANICS**	COWIN	SP	**Continuum kinematics, formulation of physical principles in the continuum context, the formulation of constitutive equations, the theories of elastic solids, viscous fluids and viscoelastic solids.**	X			X	X	X		X
BME G6000	**ADVANCED BIOMATERIALS**	NICOLL	FA		X	A, F12		X		A, F12		A, F12
BME I9300	**SCIENTIFIC ETHICS**	FRITTON, FU	SP									X
BME I9500	**ENTREP& FIN ECONOMCS**	CAPE	SP									
ENGR I1100	**INTRO TO ENGR ANALYSIS**	MORRIS	FA, SP		X			X				
ENGR I1500	**INTRO TO NUMERICAL METHODS**				X			X				
BIO V8201	**BIOSTATISTICS 1**				X			X				
PHYS V0100	**MATH METHODS IN PHYSICS**				X			X				
ENGR I1400	**APPLIED PARTIAL DIFFERENTIAL EQNS**	GANATOS	SP		X			X				
ENGR I1700	**FINITE ELEMENT METHODS**	ELVIN	FA		X			X				

Appendix Masters Courses vs. PLOS, contd.

Grove School of Engineering
Assessment Plan & Reports for Graduate Programs in Engineering
2011-2013

Department: Civil Engineering
Department representative:
Chair's signature: (first report signed by prof. McKnight)
Date Submitted:

Attach the Course vs. Program Outcomes Curriculum Matrices (Master's and PhD if applicable) to this report. Please answer all questions and make sure you can substantiate claims with documentation.

Assessment Report Academic Year 2011-2012

1. Please check your assessment activities in and before 2011-2012 and submit this page to Annita Alting, director of Institutional Effectiveness, Rm. T137 (Dean's Office) by June 22, 2012.

Activity	*Check*
Reviewed / developed program learning outcomes (PhD)	✓
Reviewed / developed program learning outcomes (Master's)	✓
Developed Curriculum Matrix / Map (PhD)	
Developed Curriculum Matrix / Map (Master's)	✓
Developed assessment tools for Doctoral assessment	✓
Developed assessment tools for Master's assessment	
Reviewed / developed course learning outcomes and included them on syllabi	✓
Collected assessment data (PhD)	✓
Collected assessment data (Masters)	
Analyzed and discussed assessment data (PhD)	
Analyzed and discussed assessment data (Master's)	
Other:	

Use of assessment data for improvement in 2011-2012:	***Check***
a. We made changes in course content	
b. We made changes in course delivery and/or pedagogy	
c. We added and/or deleted courses	
d. We made changes in pre / co-requisites	
e1. We made changes in degree requirements (PhD)	
e2. We made changes in degree requirements (Master's)	
f. We made changes in the emphasis for new / vacant faculty positions	
h. We included assessment results in faculty meetings / retreats, curriculum committee meetings, etc.	
i. We made changes in degree programs and the development of new degree program options	
j. We were able to justify past curriculum changes and show program improvement resulting from those changes	
k. We made changes in the advising processes	
l. We developed academic services for students	
m. We developed new career explorations and/or career services for students	
n. We made changes to student academic facilities such as labs and study areas	
o. We developed / improved academic and program information to students	✓
p. We shared assessment information with alumni and review/advising boards	
q. We further refined the assessment methods or implemented new assessment methods	✓
r. We made changes in instructional / mentoring emphasis for current faculty	
s. We changed our admissions criteria	
t. Other:	

Assessment Plan Academic Year 2011-2013

Department: Civil Engineering	
Department representative:	Julio F. Davalos, Chair
Chair's signature:	Julio F. Davalos,
Date Submitted:	4/18/13

Please answer all questions and submit this plan to Annita Alting, Rm T137 (Dean's Office) by October 15, 2012.

1. Which Program Learning Outcome(s) do you plan to assess in 2011-2013? List Below:

Master's program (✓ assessed through course assessment):

A. Understands and can apply the fundamentals of specialization
B. Demonstrates advanced engineering and related skills in specialization ✓
C. Is able to identify and adopt new developments in specialization.✓
D. Is able to communicate clearly the concepts and technical details of specialization✓

PhD Program:

1. Have breadth of knowledge in Civil Engineering
   - thesis/defense LO1,2,6 (motivation & rationale, literature survey, bibliography)
2. Be an expert in his/her field of CE
   - proposal LO1 (expertise in specialization)
   - thesis/defense LO9 (publication record)
3. Be capable of developing research at frontier of his/her field including: problem identification; research method; proposal
   - proposal LO2, LO3 (ability to develop original research project, good research skills)
   - thesis/defense LO 1,3,4 (problem statement, literature survey, objectives, goals and targets, quality and novelty of solution)
4. Be able to conduct research in an ethical and professional manner
   - proposal LO3 (good research skills)
   - thesis/defense LO4 (professional standards, technological and other implications of solution)
5. Be able to articulate complex ideas clearly in writing, including papers that are publishable in academic journals
   - proposal LO4 (writing skills)
   - thesis/defense LO5, 9 (quality of writing, publication record)
6. Be able to articulate complex ideas in speech, including making presentations at academic conferences and lecturing to students in his/her field.
   - proposal LO5 (oral skills)
   - thesis/defense LO 7,8 (oral presentation, question answering)

2. *Check all the assessment methods you plan to employ in 2011-2013 and the semester in which you will collect the data:*

Direct Methods	***Fall 2012***	***Spring 2013***
PhD Qualifying Exam		
PhD Proposal	x	x
PhD Dissertation & Defense	x	x
Master's Thesis or Other Capstone Experience		
Course-embedded assessment of Program Learning Outcome(s)	x	x
Lab reports		
Other Method:		

Indirect Methods	***Fall 2012***	***Spring 2013***
Student Course Survey	x (also one course in spring 2011)	x
Progress Review Form (PhD)		
Exit Survey or Interview		
Student-Faculty Mixer(s)	x	x
Focus Group		
PhD program acceptance rates	x (GSOE-wide)	
Job placements		
Alumni Feedback		
Employer Feedback		
Grade Analyses / Course or Exam Pass Rates		
Retention and Graduation Analyses	x	x
Enrollment analysis (e.g., effect of admissions criteria)		
Other Method:		

3. *Have you discussed your plans with the instructors of the courses that will be assessed?*

Yes, individually and in two faculty meetings with the director of inst. effectiveness.

4. *List the faculty members and/or departmental committee(s) who will participate in assessing the data:*

Prof. Claire McKnight (former chair), prof Julio Davalos (current chair), prof. Anil Agrawal (PhD advisor), profs Tang, McKnight and Lin(master's advisors), PhD exam committees, prof. Wittig (course instructor)

5. *When will data collected in the Fall 2012 be analyzed?*

Spring 2013

6. *When will data collected in the Spring 2013 be analyzed?*

Early fall 2013

7. *Who will write the 2012-2013 assessment report?*

Chair & dept. faculty, dir. of inst. effectiveness (draft)

8. *When will the report be shared with stakeholders?* ***(For 2013 only: please provide interim report by March 15, 2013, to Annita Alting, T137, for inclusion in Middle States PRR- see next page)***

Fall 2013.

9. Other comments:

For completeness, we will also report on an indirect course assessment in Spring 2011.

Assessment Report Academic Years 2011-2013

Department: Civil Engineering
Department representative: Julio F. Davalos, chair
Chair's signature: Julio F. Davalos
Date Submitted: 4/18/13

Please answer all questions and submit this report to Annita Alting, Rm T137 (Dean's Office) by October 15, 2013.
(For 2013 only: please provide interim report on the questions below by March 15, 2013, to Annita Alting, T137, for inclusion in Middle States Periodic Review Report due June 1, 2013)

I. Program Learning Outcomes (PLOs)

a. Which Program Learning Outcome(s) did you assess in 2011-13? List below or refer to the plan 2011-2013.

Master's program (✓ assessed through course assessment):

A. Understands and can apply the fundamentals of specialization
B. Demonstrates advanced engineering and related skills in specialization ✓
C. Is able to identify and adopt new developments in specialization.✓
D. Is able to communicate clearly the concepts and technical details of specialization✓

PhD Program:

1. Have breadth of knowledge in Civil Engineering
2. Be an expert in his/her field of CE
3. Be capable of developing research at frontier of his/her field including: problem identification; research method; proposal
4. Be able to conduct research in an ethical and professional manner
5. Be able to articulate complex ideas clearly in writing, including papers that are publishable in academic journals
6. Be able to articulate complex ideas in speech, including making presentations at academic conferences and lecturing to students in his/her field

b. How many PLOs have you assessed since this process began in Spring 2011?
List all below, including repeats:
see the above.

c. How much data was collected for this report?
We assessed two courses in the Master's program: Transport Project Evaluation (Spring 2011, indirect evaluation), with 19 students enrolled, and Transportation Safety (Fall 2012), with 25 students enrolled.
Five (5) students took the second exam (proposal) and assessment forms were completed by on average 3.2 evaluators per student and nine (9) students took the third exam (thesis & defense), which was assessed by on average 5.1 evaluators per student.

d. What DIRECT EVIDENCE of student learning did you evaluate? Direct evidence refers to student work: essays, exams, presentations, performances, exhibitions, internships, portfolios, etc. (Please attach any rubrics or other evaluative tools.)

Course / Exam	**N students (Masters/PhD)**	**Direct evidence**
PhD Proposal	5	Written Proposal and presentation to a panel of experts in the field
PhD Dissertation / Defense	9	Written thesis and presentation to committee of experts in the field
Course: CE G3500, Transportation Safety (McKnight) PLOs B,C,D	24/1	How well the 8 course objectives were achieved was measured by student performance (i.e., grades) on specific questions on the midterm and final exam and the grade on the project. The standard for achievement for a question (or set of questions) was an average grade of 85 or higher for all students who answered the question and whether 90% of the students achieved a grade of 85 or higher.

e. Was your rubric for evaluating this material reliable? That is, were the scores relatively consistent for each trait among faculty evaluators?

The Transportation Safety course was assessed by the instructor, based on midterm and final and project. Specific questions were aligned with the course and program outcomes.

The PhD proposals and dissertation & defense were evaluated by three to six evaluators per student and in this case consistency could be determined.
The proposal showed consistent scoring for all five students, i.e., less than 2 pts. difference between different evaluators of the same student. This implies a good agreement between evaluators on the meaning and standards for each learning outcome.
Seven of the dissertation & defense outcomes were also scored fairly consistently, except for outcomes 2, literature survey, and 3, objectives and goals. Three out of the nine students had scores differing two or more points between evaluators for both outcomes. Outcome three consists of a number of different indicators (definition of goals, measures of success, achievement of goals and comparison with other work) which may benefit from being scored separately. Outcome 2 also has two parts: analysis of the literature and justification of the proposed work based on the literature.
In addition, one student had strong variations in scores between evaluators, with one (external) evaluator giving "less than adequate" scores on five of the nine learning outcomes. This finding probably indicates a difference in standards between this particular evaluator and the rest, more than a lack of clarity in the formulation of the learning outcomes.

f. What are your findings from direct evidence? How do they compare to earlier evaluations of direct evidence?
Since there were no earlier evaluations, comparisons with earlier evaluations cannot be made yet.

Course / Exam	**Findings**	**Analysis and Follow-up**
PhD Proposal	All 5 students received a score of 4="good" to 5="excellent" from each evaluator on each of the five learning outcomes. Averaged across students, the learning outcomes scores ranged from 4.2 to 4.7. Scoring was consistent among different evaluators of the same student. The fact that no single evaluator assigned scores lower than "4" means that 100% of students scored "4" or higher, there were no scores lower than 3 and there were no students scoring lower than 3.50 averaged over evaluators.	Targets still need to be decided, for the average of each learning outcome across students, and for the percentage of students meeting each learning outcome at the desired level. Based on comments provided by evaluators on the scoring forms, a score of 3 (adequate) should often be interpreted as "barely passing". A target for each learning outcome could be 80% of students scoring "4" or higher and no scores lower than 3. A target for each student could be no more than one learning outcome with a score lower than 3.50.
PhD Dissertation / Defense	Scores on the nine learning outcomes ranged from "more than adequate" to "excellent". One student, who was evaluated by 6 evaluators, had 7 out of a total of 54 scores lower than 3, on outcomes 2-5, 8 and 9. One other student also had a score lower than 3 on outcome 9 (publications). Outcomes 5 (quality of writing), 8 (Questions answering) and 9 (publications) had less than 80% of students scoring "4' or higher. The percentages were 67%, 78% and 56% respectively. There were no students with more than two learning outcomes scored lower than 3.50.	Outcomes with inconsistent scoring (scores between evaluators of the same student differing 2 pts. or more) need to be reviewed and more accurately formulated. A target for each learning outcome could be 80% of students scoring "4" or higher (averaged over evaluators) and no individual evaluator scores lower than 3. A target for each student could be no more than two learning outcomes with a score lower than 3.50 (averaged over evaluators).
Course: CE G3500, Transportation Safety (McKnight)	The midterm measured 6 of the 8 learning outcomes and three of them met the standard for achievement. The final exam measured the two remaining course outcomes and repeated measurement for two outcomes of the midterm. All four outcomes on the final exam met the standard, including one outcome that did not meet the standard on the midterm. The project measured one outcome: the ability to conduct a road safety audit,	The standard for achievement for a question (or set of questions covering an outcome) was an average grade of 85 or higher for all students who answered the question and whether 90% of the students achieved a grade of 85 or higher. The response to the findings in the future for the first (multidisciplinary/multi-institutional nature of transportation safety) of the two unmet objectives

	which was measured more theoretically on the midterm, and the standard for this outcome was met in both cases. In the end, the overall results show that the course did not meet two objectives: •Explain the multidisciplinary/multi-institutional nature of transportation safety •Evaluate an analysis of crash data The report from the instructor is included at the end of this report.	is to spend additional time on this topic in class (in this semester it was covered in part of the first class) and provide a handout that would summarize the institutions and their functions as well as providing web addresses for the institutions. The response for the second unmet objective would be to assign homework that would require the students to apply the statistical analysis methods.

g. What INDIRECT EVIDENCE did you use? Indirect evidence includes students' reflections on their own learning in the form of surveys, questionnaires, focus groups, and one-minute essays as well as other evidence, such as admission rates to graduate programs, career placement rates, voluntary gifts from alumni, etc. (Please attach surveys, focus group or essay questions, etc.)

We determined retention and graduation of the PhD students starting at CCNY from fall 2008 though fall 2010. We administered end-of-course surveys for two courses, Transportation Project Evaluation and Transportation Safety.

h. What are your findings from indirect evidence? How do they compare to earlier results?

Since there were no earlier evaluations, comparisons with earlier evaluations cannot be made yet.
A first analysis of retention of PhD students starting at CCNY since fall 2008 through fall 2010, shows that of the 23 students 15 (65%) were still in the program as of fall 2012 and one had graduated, which brings the total retention + graduation rate as of fall 2012 to 70%. All 15 still retained were in good academic standing (cum. GPA 3.00 or higher). The new (acting) dean of Graduate Studies is currently reviewing admissions criteria, advising/mentoring practices and financing of PhD students, in cooperation with the departments.

Students in two Master's courses were asked how much they had learned about each of the course learning outcomes, by means of an "End-of-Course" survey. These kind of surveys are routinely used in the undergraduate courses to provide indirect assessment material for ABET accreditation and curriculum improvement. The findings are provided in the tables below.

Outcome	**CE G3500, Transportation Safety (McKnight)** **N respondents = 19** **As a result of the course, how well can you:**	Average score on question	Number of Scores ≤ 2	Achieved standards
1	Explain the multidisciplinary/multi-institutional nature of transportation safety	3.74		YES
2	Explain the state of safety of various transportation modes with emphasis on highway safety	3.63	1	YES
3	Identify major safety data sources and explain their problems and limitations	3.56		NO
4	Evaluate an analysis of crash data	3.63	1	YES
5	Explain specific safety problems such as drunk driving, speeding, etc.	3.95		YES
6	Identify safety countermeasures effective for specific circumstances	3.72		YES
7	Conduct a road safety audit	3.63	1	YES
8	Explain different safety policies	3.47	2	NO
overall	Average over all learning outcomes	3.66	84.2% ≥ 3.30	NO
Proposed Standards 1. Average score >=3.60 2. Percent with 3.30 or higher score on overall assessment >= 90% Score 1= (learned) Not at All, 2= Very Little, 3 = Some, 4= (learned) a Lot				

There are differences between students' perceptions of what they learned most of and what the instructor found in her diret assessment. E.g., Course outcome 1 received a high student score, but according to the instructor's direct assessment it did not meet the standard. The same holds for outcome 4.

The other course, CE I2900, was only assessed indirectly, so we cannot compare with direct assessments of student work. Two learning outcomes and the overall assessment did not quite meet the standards, but they were close. The findings are provided in the table below.

Outcome	**CE I2900, Transportation Project Evaluation (Wittig)** **N respondents = 16** **As a result of the course:**	**Average score on question**	**Number of Scores ≤ 2**	**Achieved standards**
1	Can you conduct a cost benefit analysis?	3.87		
2	As part of the cost benefit analysis, can you identify the impacts of a transportation project?	3.69		
3	Can you explain the conventional methods for establishing the monetary value of typical impacts of transportation projects?	3.69		
4	As part of the cost benefit analysis, can you discount the value of future impacts using the concepts of engineering economy?	3.87		
5	As part of the cost benefit analysis, can you set the scope and analysis period for the evaluation of a transportation project?	3.56		NO
6	As part of the cost benefit analysis, can you perform a sensitivity analysis, including determining which impacts to check and how much they might vary?	3.81		
7	Can you describe the different methods for comparing alternatives?	3.50	1	NO
8	Can you explain how to compare alternatives with differing lives to determine the best alternative to recommend?	3.69		
9	Can you explain the strengths and weaknesses of cost benefit analyses?	3.75		
10	Can you explain the methods for accounting for risk and uncertainty in the evaluation of transportation projects?	3.63		
overall	Average over all learning outcomes	3.71	87.5% ≥ 3.30	
Proposed Standards 1. Average score >=3.60 2. Percent with 3.30 or higher score on overall assessment >= 90% Score 1= (learned) Not at All, 2= Very Little, 3 = Some, 4= (learned) a Lot				

II. Course Learning Outcomes

a. What percentage of full-time faculty members complied with your request to submit syllabi with Course Learning Outcomes (CLOs) in the spring of 2013?

Eight out of twelve (75%) of FT faculty in Water Resources, for both spring and fall semesters - many syllabi already had LOs before spring 2013. Four out of five FT faculty in Transportation (80%) submitted syllabi, and four out of six (67%) of faculty in Structures submitted syllabi. The syllabi already had learning outcomes well before spring 2013.

b. What was the annual (2012-13) percentage of compliance?

ca. 75%

c. Are faculty proficient in composing CLOs? Are they able to align their CLOs with the PLOs? If not, how do you plan to address issues of faculty compliance and competence in this area?

Because of their experience with ABET, all faculty know how to compose CLOs and align CLOs with the PLOs. If the analysis of learning outcomes on syllabi shows any need for improvement this will be addressed by the director of institutional effectiveness and/or the graduate coordinators and chair.

III. 2012-13 Assessment Plan vs. 2012-13 Assessment Report

a. Have you deviated from the 2012-13 Assessment Plan? If so, how—and why?

Yes.

We intended to assess courses in the Structures and Water Resources specializations as well, but this proved too ambitious. Therefore, we plan to give priority to these two specializations in the Fall 2013 assessments, using prof. McKnight's approach as a model for other course-embedded assessments.

IV. Recommendations and Actions

a. When will you share the 2012-13 assessment report with stakeholders? What opportunities will you or your Chair provide for faculty to discuss the findings?

b. Are you piloting any new courses or proposing any curricular changes, minor or major, based on your assessment thus far? If so, please describe and fill out the checklist below.

Use of assessment data for improvement in 2012-2013:	***Check***
a. We made changes in course content	*x*
b. We made changes in course delivery and/or pedagogy	
c. We added and/or deleted courses	
d. We made changes in pre / co-requisites	
e1. We made changes in degree requirements (PhD)	
e2. We made changes in degree requirements (Master's)	
f. We made changes in the emphasis for new / vacant faculty positions	
h. We included assessment results in faculty meetings / retreats, curriculum committee meetings, etc.	*x*
i. We made changes in degree programs and the development of new degree program options	
j. We were able to justify past curriculum changes and show program improvement resulting from those changes	
k. We made changes in the advising processes	
l. We developed academic services for students	
m. We developed new career explorations and/or career services for students	
n. We made changes to student academic facilities such as labs and study areas	
o. We developed / improved academic and program information to students	
p. We shared assessment information with alumni and review/advising boards	
q. We further refined the assessment methods or implemented new assessment methods	*x*
r. We made changes in instructional / mentoring emphasis for current faculty	
s. We changed our admissions criteria	
t. Other: The director of institutional effectiveness presented the course assessment approach used by prof. Claire McKnight at one of the twice semester's CUNY Assessment seminars for faculty across CUNY. The seminars are organized by the CUNY Assessment Council to provide opportunities for faculty to share and discuss good practices in learning outcomes assessment. The response from faculty and program administrators to prof. McKnight's useful and efficient approach to course assessment and how it could be embedded in program assessment, was very favorable. Four participants requested more information and were interested in trying out the approach themselves.	*x*

Appendix. Achievement of the objectives of CE G3500 (Transportation Safety), by Claire McKnight

Explanation and response

The course has eight objectives (See below). How well they were achieved was measured by student performance (i.e., grades) on specific questions on the midterm and final exam and the grade on the project. The standard for achievement for a question (or set of questions) was an average grade of 85 or higher for all students who answered the question and whether 90% of the students achieved a grade of 85 or higher. The evaluation of the achievement was analyzed on the associated spread sheet. The results are shown in the table below.

Evaluation of Achievement of Course Objectives for CE G3500 (Transportation Safety)
As taught in Fall 2012

Objectives	MIDTERM	FINAL EXAM	PROJECT	Overall
Explain the multidisciplinary/multi-institutional nature of transportation safety	NO			NO
Explain the state of safety of various transportation modes with emphasis on highway safety	NO	YES		YES*
Identify major safety data sources and explain their problems and limitations	YES			YES
Evaluate an analysis of crash data	NO			NO
Explain specific safety problems such as drunk driving, speeding, etc.		YES		YES
Identify safety countermeasures effective for specific circumstances	YES	YES		YES
Conduct a road safety audit	YES		YES	YES
Explain different safety policies		YES		YES

*The average of the statistics for the two exams for questions relevant to this objective met the standard.

The results show that the course did not meet two objectives:

- Explain the multidisciplinary/multi-institutional nature of transportation safety
- Evaluate an analysis of crash data

The response to this in the future for the first (multidisciplinary/multi-institutional nature of transportation safety) of the two unmet objectives is to spend additional time on this topic in class (in this semester it was covered in part of the first class) and provide a handout that would summarize the institutions and their functions as well as providing web addresses for the institutions.
The response for the second unmet objective would be to assign homework that would require the students to apply the statistical analysis methods.

Grove School of Engineering
Assessment Plan & Reports for Graduate Programs in Engineering
2011-2013

Department: Chemical Engineering
Department representative: Jeffrey Morris, Chair (acting)
Chair's signature: [signature]
Date Submitted: April 17, 2013

Attach the Course vs. Program Outcomes Curriculum Matrices (Master's and PhD if applicable) to this report. Please answer all questions and make sure you can substantiate claims with documentation.

Assessment Report Academic Year 2011-2012

1. Please check your assessment activities in and before 2011-2012 and submit this page to Annita Alting, director of Institutional Effectiveness, Rm. T137 (Dean's Office) by June 22, 2012.

Activity	*Check*
Reviewed / developed program learning outcomes (PhD)	*x*
Reviewed / developed program learning outcomes (Master's)	
Developed Curriculum Matrix / Map (PhD)	*x*
Developed Curriculum Matrix / Map (Master's)	
Developed assessment tools for Doctoral assessment	*x*
Developed assessment tools for Master's assessment	
Reviewed / developed course learning outcomes and included them on syllabi	*partial*
Collected assessment data (PhD)	*x*
Collected assessment data (Masters)	
Analyzed and discussed assessment data (PhD)	*tbd*
Analyzed and discussed assessment data (Master's)	
Other:	

Use of assessment data for improvement in 2011-2012:	***Check***
a. We made changes in course content	
b. We made changes in course delivery and/or pedagogy	
c. We added and/or deleted courses	
d. We made changes in pre / co-requisites	
e1. We made changes in degree requirements (PhD)	
e2. We made changes in degree requirements (Master's)	
f. We made changes in the emphasis for new / vacant faculty positions	
h. We included assessment results in faculty meetings / retreats, curriculum committee meetings, etc.	
i. We made changes in degree programs and the development of new degree program options	
j.We were able to justify past curriculum changes and show program improvement resulting from those changes	
k.We made changes in the advising processes	
l.We developed academic services for students	
m.We developed new career explorations and/or career services for students	
n.We made changes to student academic facilities such as labs and study areas	
o. We developed / improved academic and program information to students	*x*
p.We shared assessment information with alumni and review/advising boards	
q.We further refined the assessment methods or implemented new assessment methods	*x*
r.We made chamges in instucttional / mentoring emphasis for current faculty	
s.We changed our admissions criteria	
t. Other:	

Assessment Plan Academic Year 2012-2013

Department: Chemical Engineering
Department representative: Jeffrey Morris, Chair
Chair's signature: JMorris
Date Submitted: 4/17/2013

Please answer all questions and submit this plan to Annita Alting, Rm T137 (Dean's Office) by October 15, 2012.

1. Which Program Learning Outcome(s) do you plan to assess in 2012-2013? List Below:

PhD:

I. Apply knowledge of mathematics, science, and engineering to solve engineering problems and undertake teaching and research;

Qualifying Exam (form A): *-The student is able to apply the fundamentals of Chemical Engineering to solve new problems;*
- The student comprehends specific topics of current interest in Chemical Engineering Research;
- The student shows potential for conducting Ph.D. level research.

Proposal (FormB): *- The student uses and applies such tools of research as are necessary to conduct research in the field (e.g., computer languages, novel experimental techniques, statistics, etc.,);*

II. Demonstrate potential leadership skills to succeed in the profession *(not yet assessed).*

III. Communicate effectively both as individuals and leaders of multidisciplinary and multicultural teams in a diverse global economy;

Qualifying Exam (form A): *- The student is able to effectively present technical materials to peers and faculty, orally and in writing;*

Proposal (Form B): *- The student has written a clear, comprehensive, and accurate proposal describing the planned research for the Ph.D. degree;*

Dissertation & defense: (form C) *- Exam topics 5,7,8 (quality of writing, oral presentation, question answering)*

IV. Demonstrate the ability to engage in life-long learning as independent scholars;

Dissertation & defense *- Exam topics 1, 2,3, 6 (problem statement, literature survey/bibliography and objectives & goals)*

V. Understand the importance of the ethical, safety, socio-economic, and environmental issues related to the Chemical Engineering profession;

Dissertation & Defense *- Exam topic 4 (technical soundness, professional standards and implications of solution)*

VI. Plan and conduct scholarly activities that make original contributions to the knowledge base in one ore more areas of specialization within the Chemical Engineering discipline.

Proposal (Form B):
- The student has identified a new research topic for the Ph.D. degree;
- The student has evaluated and compared several solution methodologies and chosen an appropriate approach;
- The student has written a clear, comprehensive, and accurate proposal describing the planned research for the Ph.D. degree.

Dissertation & Defense: *- Exam topics 4, 9 (novelty of solution, publication record)*

No Master's learning outcomes were assessed this semester.

2. Check all the assessment methods you plan to employ in 2012-2013 and the semester in which you will collect the data:

Direct Methods	***Fall 2012***	***Spring 2013***
PhD Qualifying Exam	*x*	
PhD Proposal	*x*	*x*
PhD Dissertation & Defense	*x*	*x*
Master's Thesis or Other Capstone Experience		
Course-embedded assessment of Program Learning Outcome(s)		
Lab reports		
Other Method:		

Indirect Methods	***Fall 2012***	***Spring 2013***
Student Course Survey		
Progress Review Form (PhD)		
Exit Survey or Interview		
Student-Faculty Mixer(s)		
Focus Group		
PhD program acceptance rates	*x (GSOE wide)*	
Job placements		
Alumni Feedback		
Employer Feedback		
Grade Analyses / Course or Exam Pass Rates		
Retention and Graduation Analyses		*x*
Enrollment analysis (e.g., effect of admissions criteria)		
Other Method:		

3. Have you discussed your plans with the instructors of the courses that will be assessed?

No courses were assessed - PhD LOs were assessed through the exams. Master's program has only 6 students.

4. List the faculty members and/or departmental committee(s) who will participate in assessing the data:

Chair and Graduate program advisors, exam committees, PhD mentors

5.When will data collected in the Fall 2012 be analyzed? Spring 2013

6. When will data collected in the Spring 2013 be analyzed? Early Fall 2013

7. Who will write the 2012-2013 assessment report?

The report will be drafted by the director of inst. assessment based on the data collected and other materials provided, and finalized by the Chair and faculty involved in the assessments.

8. When will the report be shared with stakeholders? ***(For 2013 only: please provide interim report by March 15, 2013, to Annita Alting, T137, for inclusion in Middle States PRR- see next page)***

Fall 2013

9. Other comments:

Assessment Reports Academic Year 2011-2013

Department: Chemical Engineering
Department representative: Jeffrey Morris, Chair
Chair's signature: JMorris
Date Submitted: 4/17/2013

Please answer all questions and submit this report to Annita Alting, Rm T137 (Dean's Office) by October 15, 2013.
(For 2013 only: please provide interim report on the questions below by March 15, 2013, to Annita Alting, T137, for inclusion in Middle States Periodic Review Report due June 1, 2013)

I. Program Learning Outcomes (PLOs)

a. Which Program Learning Outcome(s) did you assess in 2012-13? List below or refer to the plan 2012-2013.

see plan

Master's PLOs were assessed indirectly only, because of the small number of students in the Master's.

b. How many PLOs have you assessed since this process began in Spring 2011?
List all below, including repeats:

see plan

c. How much data was collected for this report?

We assessed the results of the qualifying exam taken by 7 students in the spring of 2011 and assessed by on average 1.9 evaluators per student.
A total of 8 students took the second exam (proposal) in the period august 2011-september 2012, and the assessment forms were completed by on average 3.9 evaluators per student
A total of 9 students took the third exam (thesis & defense) in the period june 2011-november 2012, which was assessed by on average 3.9 evaluators per student.
We also determined retention and graduation for all Phd students in ChE who started at CCNY from fall 2008 through fall 2010.
We checked academic standing of the six Master's students enrolled in spring 2013.

d. What DIRECT EVIDENCE of student learning did you evaluate? Direct evidence refers to student work: essays, exams, presentations, performances, exhibitions, internships, portfolios, etc. (Please attach any rubrics or other evaluative tools.)

Course / Exam	N students (Masters/PhD)	Direct evidence
PhD Qualifying Exam	7	Students' completed exams
PhD Proposal	8	Written Proposal and presentation to a panel of experts in the field
PhD Dissertation / Defense	9	Written thesis and presentation to committee of experts in the field

e. Was your rubric for evaluating this material reliable? That is, were the scores relatively consistent for each trait among faculty evaluators?

To determine consistency, we did a simple analysis by looking at the number of students out of the total assessed for each exam, who received scores differing 2 or more points (on the 5 pt. scale) for a particular learning outcome. A more rigorous statistical analysis of consistency/reliability, using data from all programs together, is provided in the executive summary in the institutional report for the Grove School of Engineering.

The results can be summarized as follows:

Qualifying exam (form A):
Learning outcomes 1, 3 and 4 each had one student out of seven with scores between evaluators differing 2 points.
Learning outcome 2 had no students with scores between evaluators differing 2 or more points.

Proposal (form B):
None of the learning outcomes showed scores for one student differing 2 or more points between evaluators.

Dissertation/Defense (form C):
Learning outcome 7. Oral presentation. had 3 out of 9 students with scores that differed 2 pts between evaluators.
Learning outcome 9. Publications. had 2 out of 9 students with inconsistent scores.
Outcomes 2,3,4,6, and 8 each had one student wit inconsistent scores.
Outcomes 1 and 5 showed no inconsistent scoring patterns.

Theconclusion is that generally scoring patterns were reasonably consistent, except for "oral presentation" and perhaps to some extent "publications" on the dissertation & defense exam.

f. What are your findings from direct evidence? How do they compare to earlier evaluations of direct evidence?
There are no earlier evaluations of direct evidence so no comparisons can be made yet.

Course / Exam	Findings	Analysis and Follow-up
PhD Qualifying Exam	LOs 1,2, 3 and 4 had 14, 57, 42, 42% of the seven students scoring "4" or higher respectively, averaged over evaluators. Only LO4 had all student scores higher than "3". Three out of the seven students had more than one learning outcome with a score lower than 3.50. (LO1: apply fundamentals of ChE; LO2: comprehend specific ChE topics; LO3: show potential for PhD research; LO4: communication)	Targets still need to be decided, for the average of each learning outcome across students, and for the percentage of students meeting each learning outcome at the desired level. Based on comments provided by evaluators on the scoring forms, a score of 3 (adequate) should often be interpreted as "barely passing". A target for each learning outcome could be 80% of students scoring "4" or higher, and all scores higher than 3.0. A target for each student could be no more than one learning outcome with a score lower than 3.50. The findings show that these proposed targets were not met but we need more data to understand why.
PhD Proposal	Student scores ranged from satisfactory (3.6) to excellent (5) on all four outcomes. Two LOs had all students scoring "4" or higher, the other two had 83% scoring "4" or higher. There were no students with scores lower than 3.5 on any of the four outcomes.	Targets still need to be decided, for the average of each learning outcome across students, and for the percentage of students meeting each learning outcome at the desired level. Based on comments provided by evaluators on the scoring forms, a score of 3 (adequate) should often be interpreted as "barely passing". A target for each learning outcome could be 80% of students scoring "4" or higher, and all scores higher than 3.0. A target for each student could be no more than one learning outcome with a score lower than 3.50. The findings show that all LOs and all students met the minimum standards.
PhD Dissertation / Defense	All students received an average score of "satisfactory" (3.5) to "excellent" (5.0) on all but the ninth learning outcome. The 9th learning outcome had one student with a score of less than adequate (2.75). LOs 8 and 9 had less than 80% of students scoring "4" or higher: 56 and 78% respectively. There were no students with more than one score lower than 3.50 on the nine learning outcomes.	Targets still need to be decided, for the average of each learning outcome across students, and for the percentage of students meeting each learning outcome at the desired level. A target for each learning outcome could be 80% of students scoring "4" or higher, and all scores higher than 3.0. In that case, outcomes 8 and 9 did not meet the target. A target for each student could be no more than two learning outcomes with a score lower than 3.50. In that case, all students met the target. The "oral" presentation outcome may need a more detailed description or scoring guide.

g. What INDIRECT EVIDENCE did you use? Indirect evidence includes students' reflections on their own learning in the form of surveys, questionnaires, focus groups, and one-minute essays as well as other evidence, such as admission rates to graduate programs, career placement rates, voluntary gifts from alumni, etc. (Please attach surveys, focus group or essay questions, etc.)

Retention and graduation in the PhD program since it came to CCNY in fall 2008.
Academic standing of PhD and Master's students in fall 2008.

h. What are your findings from indirect evidence? How do they compare to earlier results?

A first analysis of retention of the 25 PhD students starting in CHE since fall 2008 though fall 2010, 23 students (92%) were still enrolled in the program in fall 2012, and all were in good academic standing (Cum. GPA 3.00 or higher).

Except for one re-entry student, all 6 Master's students are in good to excellent academic standing. From the transcript of the re-entry student it appears that he is able to do very well, but may have encountered some personal hardship causing a drop in GPA (e.g., economical or family cisrcumstances).

II. Course Learning Outcomes
a. What percentage of full-time faculty members complied with your request to submit syllabi with Course Learning Outcomes (CLOs) in the spring of 2013?

Syllabi with learning outcomes have been in place long before spring of 2013, although not for all courses and not all learning outcomes were explicitly formulated in terms of demonstrated student knowledge and behavior.
About 54% of FT faculty had syllabi with learning outcomes.

b. What was the annual (2012-13) percentage of compliance?

see the above.

c. Are faculty proficient in composing CLOs? Are they able to align their CLOs with the PLOs? If not, how do you plan to address issues of faculty compliance and competence in this area?

Because of their experience with ABET, all faculty know how to compose CLOs and align CLOs with the PLOs. If the anaysis of learning outcomes on syllabi shows any need for improvement this will be addressed by the director of institutional effectiveness and/or the graduate coordinators.

III. 2012-13 Assessment Plan vs. 2012-13 Assessment Report
a. Have you deviated from the 2012-13 Assessment Plan? If so, how—and why? No.

IV. Recommendations and Actions
a. When will you share the 2012-13 assessment report with stakeholders? What opportunities will you or your Chair provide for faculty to discuss the findings?

Fall 2013 - faculty meetings

b. Are you piloting any new courses or proposing any curricular changes, minor or major, based on your assessment thus far? If so, please describe and fill out the checklist below.

Use of assessment data for improvement in 2012-2013:	***Check***
a. We made changes in course content	
b. We made changes in course delivery and or pedagogy	
c. We added and or deleted courses	
d. We made changes in pre / co-requisites	
e1. We made changes in degree requirements (PhD)	
e2. We made changes in degree requirements (Master's)	
f. We made changes in the emphasis for new / vacant faculty positions	
h. We included assessment results in faculty meetings / retreats, curriculum committee meetings, etc.	*x*
i. We made changes in degree programs and the development of new degree program options	
j.We were able to justify past curriculum changes and show program improvement resulting from those changes	
k.We made changes in the advising processes	
l.We developed academic services for students	
m.We developed new career explorations and/or career services for students	
n.We made changes to student academic facilities such as labs and study areas	
o. We developed / improved academic and program information to students	*x*
p.We shared assessment information with alumni and review/advising boards	
q.We further refined the assessment methods or implemented new assessment methods	*x*
r.We made chamges in instucttional / mentoring emphasis for current faculty	
s.We changed our admissions criteria	
t. Other:Meetings with new Dean of graduate studies to review admissions, advising and funding of graduate students	*x*

Grove School of Engineering
Assessment Plan & Reports for Graduate Programs in Engineering
2011-2013

Department: Computer Science
Department representative: Dr. Edward Camp
Chair's signature: (signed June 15, 2012)
Date Submitted: June 15, 2012

Attach the Course vs. Program Outcomes Curriculum Matrices (Master's and PhD if applicable) to this report.
Please answer all questions and make sure you can substantiate claims with documentation.

Assessment Report Academic Year 2011-2012

1. Please check your assessment activities in and before 2011-2012 and submit this page to Annita Alting, director of Institutional Effectiveness, Rm. T137 (Dean's Office) by June 22, 2012.

Activity	*Check*
Reviewed / developed program learning outcomes (PhD)	
Reviewed / developed program learning outcomes (Master's)	*X*
Developed Curriculum Matrix / Map (PhD)	
Developed Curriculum Matrix / Map (Master's)	
Developed assessment tools for Doctoral assessment	
Developed assessment tools for Master's assessment	*X*
Reviewed / developed course learning outcomes and included them on syllabi	*X*
Collected assessment data (PhD)	
Collected assessment data (Masters)	*X*
Analyzed and discussed assessment data (PhD)	
Analyzed and discussed assessment data (Master's)	*X*
Other:	

Use of assessment data for improvement in 2011-2012:	***Check***
a. We made changes in course content	
b. We made changes in course delivery and/or pedagogy	
c. We added and/or deleted courses	
d. We made changes in pre / co-requisites	
e1. We made changes in degree requirements (PhD)	
e2. We made changes in degree requirements (Master's)	
f. We made changes in the emphasis for new / vacant faculty positions	
h. We included assessment results in faculty meetings / retreats, curriculum committee meetings, etc.	*X*
i. We made changes in degree programs and the development of new degree program options	
j. We were able to justify past curriculum changes and show program improvement resulting from those changes	
k. We made changes in the advising processes	
l. We developed academic services for students	
m. We developed new career explorations and/or career services for students	
n. We made changes to student academic facilities such as labs and study areas	
o. We developed / improved academic and program information to students	
p. We shared assessment information with alumni and review/advising boards	
q. We further refined the assessment methods or implemented new assessment methods	
r. We made chamges in instucttional / mentoring emphasis for current faculty	
s. We changed our admissions criteria	
t. Other:	

Assessment Plan Academic Year 2012-2013

Department: Computer Science
Department representative: Dr. Edward Camp
Chair's signature: signed June 15, 2012
Date Submitted: June 15, 2012

Please answer all questions and submit this plan to Annita Alting, Rm T137 (Dean's Office) by October 15, 2012.

1. Which Program Learning Outcome(s) do you plan to assess in 2012-2013? List Below:

From Masters of Science (MS program)

a) An ability to apply knowledge of computing and mathematics appropriate to the discipline.
b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
d) An ability to function effectively on teams to accomplish a common goal.
e) An understanding of professional, ethical, legal, security and social issues and responsibilities.
f) An ability to communicate effectively with a ranges of audiences.
g) An ability to analyze the local and global impact of computing on individuals, organizations, and society.
h) --
i) An ability to use current techniques, skills, and tools necessary for computing practice.
j) An ability to apply mathematical foundations, alogorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
k) An ability to apply design and development principles in the construction of software systems of varying complexity.

From Masters of Information Systems (MIS program)

a) An ability to analyze a problem, and identify and define the system requirements appropriate to its solution;
b) An ability to design, implement and evaluate a computer-based information system to meet desired needs;
c) An ability to function effectively on teams to accomplish a common goal;
d) An awareness of professional, ethical, legal, security, and social issues and responsibilities;
e) Recognition of the need for, and an ability to engage in, continuing professional development;
f) An ability to communicate effectively with a range audiences;
g) An ability to use current techniques, skills, and tools necessary for information systems practices;
h) An ability to apply design and development principles in the construction of information systems of varying complexity.

2. Check all the assessment methods you plan to employ in 2012-2013 and the semester in which you will collect the data:

Direct Methods	***Fall 2012***	***Spring 2013***
Master's Thesis or Other Capstone Experience		
Course-embedded assessment of Program Learning Outcome(s)	*X*	*X*
Lab reports		
Other Method:		

Indirect Methods	***Fall 2012***	***Spring 2013***
Student Course Survey		*X*
Progress Review		
Exit Survey or Interview		
Student-Faculty Mixer(s)		
Focus Group		
PhD program acceptance rates		
Job placements		
Alumni Feedback		*X*

Employer Feedback		*X*
Grade Analyses / Course or Exam Pass Rates		
Retention and Graduation Analyses		
Enrollment analysis (e.g., effect of admissions criteria)		
Other Method:		

3. Have you discussed your plans with the instructors of the courses that will be assessed? **Yes**

4. List the faculty members and/or departmental committee(s) who will participate in assessing the data: **Department Assessment Committee**

5. When will data collected in the Fall 2012 be analyzed? **May 2013**

6. When will data collected in the Spring 2013 be analyzed? **August 2013**

7. Who will write the 2012-2013 assessment report? **Chair and Assessment Officer**

8. When will the report be shared with stakeholders? ***(For 2013 only: please provide interim report by March 15, 2013, to Annita Alting, T137, for inclusion in Middle States PRR- see next page)***

9. Other comments:

Assessment Report Academic Year 2012-2013

Department: **Computer Science**
Department representative: **Dr. Edward Camp**
Chair's signature: Douglas R Troeger
Date Submitted: **April 10, 2013**

Please answer all questions and submit this report to Annita Alting, Rm T137 (Dean's Office) by October 15, 2013. (For 2013 only: please provide interim report on the questions below by March 15, 2013, to Annita Alting, T137, for inclusion in Middle States Periodic Review Report due June 1, 2013)

I. Program Learning Outcomes (PLOs)

a. Which Program Learning Outcome(s) did you assess in 2012-13? List below or refer to the plan 2012-2013.

a. through k except for e and h of Masters and a through h of MIS

MS Program Outcomes

a) **An ability to apply knowledge of computing and mathematics appropriate to the discipline.**
b) **An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.**
c) **An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.**
d) **An ability to function effectively on teams to accomplish a common goal.**
e) **An understanding of professional, ethical, legal, security and social issues and responsibilities.**
f) **An ability to communicate effectively with a ranges of audiences.**
g) **An ability to analyze the local and global impact of computing on individuals, organizations, and society.**
h) **--**
i) **An ability to use current techniques, skills, and tools necessary for computing practice.**
j) **An ability to apply mathematical foundations, alogorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.**
k) **An ability to apply design and development principles in the construction of software systems of varying complexity.**

MIS Program Outcomes

a) **An ability to analyze a problem, and identify and define the system requirements appropriate to its solution;**
b) **An ability to design, implement and evaluate a computer-based information system to meet desired needs;**
c) **An ability to function effectively on teams to accomplish a common goal;**
d) **An awareness of professional, ethical, legal, security, and social issues and responsibilities;**
e) **Recognition of the need for, and an ability to engage in, continuing professional development;**
f) **An ability to communicate effectively with a range audiences;**
g) **An ability to use current techniques, skills, and tools necessary for information systems practices;**
h) **An ability to apply design and development principles in the construction of information systems of varying complexity.**

b. How many PLOs have you assessed since this process began in Spring 2011?

MS - 9, MIS - 8

List all below, including repeats:

see above

c. How much data was collected for this report?

We assessed two courses in the CSC Master's program: Web / Geographical Info Systems (12 students, of whom 4 undergraduates) and Database Systems 1 (20 students). We assessed two courses in the MIS program (Master's in Information Systems): Statistics and Decison Analysis (24 students) and System Analysis and Design (13 students). We conducted retention and graduation analyses on the cohorts of academic years 2004 through 2010, for CSC and MIS Master's programs.

d. What DIRECT EVIDENCE of student learning did you evaluate? Direct evidence refers to student work: essays, exams, presentations, performances, exhibitions, internships, portfolios, etc. (Please attach any rubrics or other evaluative tools.)

Course / Exam	N students	Direct evidence
CSC I0802: Web/Geogrph Info Sys (Zhang). PLOs a,b,c,d,f, g, i, k (MS)	12 (incl. 4 undergrad.)	Projects, Midterm Exam, Term Project (group-based)
CSC I1000 Database Systems 1 (Wei). PLOs a, b, c, i, j (MS)	20	Assignments, quizzes, midterm, projects, final exam, team project
MIS G1010: Stats & Dec. Analysis (Mowshowitz) PLO a, h, j (MIS)	24	Students' answers to four questions on the first and second tests that were aligned with the learning outcomes of the course.
MIS G4010: System Analysis and Design (Kawaguchi). PLOs b,c,i,j,k (MIS)	13	Project assignments and closed-book exams.

e. Was your rubric for evaluating this material reliable? That is, were the scores relatively consistent for each trait among faculty evaluators?

The coursework was evaluated by the instructor of each course using standard grading techniques for the outcome-related assignments and exam questions. There was one evaluator per course.

f. What are your findings from direct evidence? How do they compare to earlier evaluations of direct evidence?

Since there were no earlier evaluations, comparisons with earlier evaluations cannot be made yet.
The findings are still being reviewed to determine what follow-up is needed if any. The course assessments for each learning outcome provided by the instructors of the course show that they set detailed targets for below, meeting and exceeding expectations, and explained how the assignments, exams and projects measured specific learning outcomes. The table below shows a summary of the findings.

Course / Exam	Findings: % of students in the course who meet or exceed the expectation.		Analysis and Follow-up
CSC I0802: Web/Geogrph Info Sys (Zhang)	CLO1: Knowledge of the basic concepts, principles, technologies and best practices of Web-GIS [a,b,c,g,i,k]	85%	under review
	CLO2: Ability to analyze and implement real world Web-GIS applications [a,b,c,k]	90%	
	CLO3: Ability to collaborate effectively in small teams and complete Web-GIS related projects both individually and in teams and, gain confidence in seeking GIS and Web-GIS related jobs in government agencies and industries [d, f]	97%	
CSC I1000: Database Systems 1 (Wei)	CLO1: Knowledge of relational data model and Entity-Relation data model [a, i ,j]	80%	under review
	CLO2: Knowledge of relational algebra [a, b]	83%	
	CLO3: Knowledge of database manipulation and definition language SQL [a, i]	90%	
	CLO4: Knowledge of database constraints and triggers [a, i, j]	90%	
	CLO5: Knowledge of efficient database organization and processing techniques [a, i, j]	83%	

MIS G1010: Stats & Dec. Analysis (Mowshowitz)	CLO1: Ability to display and interpret statistical data [a, b, i]	86%	
	CLO2: Ability to apply the common discrete and continuous probability models [a, b, i]	36%	Need to give more exercises involving normal distributions
	CLO3: Ability to develop linear regression models [a, b, i]	58%	More practice exercises needed on regression problems
	CLO4: Ability to apply hypothesis testing and compute confidence intervals [a, b, i]	79%	
MIS G4010: System Analysis and Design (Kawaguchi)	CLO1: Knowledge of the standard process model known as a systems development life cycle (SDLC), both from system analyst and stakeholder standpoint and from general organizational context [a, c]	85%	under review
	CLO2: Knowledge of key technical elements to perform requirements analysis, requirements definition and validation, and project planning and management [a, b]	85%	
	CLO3: Ability to utilize various modern CASE tools for system analysis and design [a, b, c]	77%	
	CLO4: Ability to perform feasibility assessment and cost analysis for information systems project [a, b, d, f, g]	85%	
	CLO5: Knowledge of critical analysis/design techniques such as Unified Modeling Language (UML) and Business Process Modeling and Notation (BPMN) [a, b, f]	77%	
	CLO6: Ability to identify, propose, and initiate an information systems project in a formal way [a,b,c,d,e,f,g]	85%	

g. What INDIRECT EVIDENCE did you use? Indirect evidence includes students' reflections on their own learning in the form of surveys, questionnaires, focus groups, and one-minute essays as well as other evidence, such as admission rates to graduate programs, career placement rates, voluntary gifts from alumni, etc. (Please attach surveys, focus group or essay questions, etc.)

Student Retention and Graduation Rates, for cohorts starting in academic years 2004 through 2010.

h. What are your findings from indirect evidence? How do they compare to earlier results?

Retention rates are at a high level.

Table 1 shows that in Computer Science, 54-67% or more obtained the Master's degree within 3 years (150% of the nominal curriculum length). Of those who did not graduate, those in good standing may have continued their studies as Ph.D. students, either at the CUNY Graduate Center or elsewhere, so the final "success" rate is probably higher than what the tables show.

The MIS retention and graduation rates in Table 2 show that two thirds of the Fall 2009 cohort graduated within three years, and the same proportion of the Fal 2010 cohort graduated within two years. The MIS program has no first time spring enrollments. The graduation rates are very good, considering that the MIS program is a rigorous evening program aimed at working professionals with a background in engineering or science who wish to develop their careers in information management.

	Table 1. Retained and Graduated CSC Master's, % of N						
Cohort	Start	1st-2nd	2nd-3rd	3rd-4th	4th-5th	5th-6th	6th-7th
AY04, N=64	100	73	68	71	69	71	69
graduated	0	10	42	63	66	68	68
AY05, N=90	100	83	72	76	74	77	77
graduated	0	9	56	67	72	77	77
AY06, N=85	100	69	64	64	59	61	
graduated	0	1	36	55	58	60	
AY07, N=91	100	62	58	54	55		
graduated	0	0	37	52	54		
AY08, N=35	100	74	69	63			
graduated	0	0	57	60			
AY09, N=47	100	77	55				
graduated	0	2	34				
AY10, N=43	100	67					
graduated	0	0					

	Table 2. Retained and Graduated MIS Master's, % of N						
Cohort	Start	1st-2nd	2nd-3rd	3rd-4th	4th-5th	5th-6th	6th-7th
Fa09, N=12	100	83	67	67			
graduated	0	0	0	67			
Fa10, N=12	100	75	67				
graduated	0	0	67				
Fa11, N=17	100	71					
graduated	0	0					
Fa12, N=24	100						
graduated	0						

II. Course Learning Outcomes

a. What percentage of full-time faculty members complied with your request to submit syllabi with Course Learning Outcomes (CLOs) in the spring of 2013?

ca. 50%

b. What was the annual (2012-13) percentage of compliance?

tbd

c. Are faculty proficient in composing CLOs? Are they able to align their CLOs with the PLOs? If not, how do you plan to address issues of faculty compliance and competence in this area?

The inclusion of learning outcomes on syllabi shows a need for improvement, which the Department Chair is addressing.
We will improve the quantity and quality of assessments as faculty become more familiar with the process.

III. 2012-13 Assessment Plan vs. 2012-13 Assessment Report

a. Have you deviated from the 2012-13 Assessment Plan? If so, how—and why?

Yes, instead of alumni and employer surveys for indirect assessment, we conducted retention and graduation analyses because we really wanted t o know how we were doing in that area.

IV. Recommendations and Actions

a. When will you share the 2012-13 assessment report with stakeholders? What opportunities will you or your Chair provide for faculty to discuss the findings?

Fall 2013, in Assessment Committee and departmental faculty meeting.

b. Are you piloting any new courses or proposing any curricular changes, minor or major, based on your assessment thus far? If so, please describe and fill out the checklist below.

Use of assessment data for improvement in 2012-2013:	***Check***
a. We made changes in course content	
b. We made changes in course delivery and/or pedagogy	*X*
c. We added and/or deleted courses	
d. We made changes in pre / co-requisites	
e1. We made changes in degree requirements (PhD)	
e2. We made changes in degree requirements (Master's)	
f. We made changes in the emphasis for new / vacant faculty positions	
h. We included assessment results in faculty meetings / retreats, curriculum committee meetings, etc.	*X*
i. We made changes in degree programs and the development of new degree program options	
j. We were able to justify past curriculum changes and show program improvement resulting from those changes	
k. We made changes in the advising processes	
l. We developed academic services for students	
m. We developed new career explorations and/or career services for students	
n. We made changes to student academic facilities such as labs and study areas	
o. We developed / improved academic and program information to students	
p. We shared assessment information with alumni and review/advising boards	
q. We further refined the assessment methods or implemented new assessment methods	
r. We made chamges in instucttional / mentoring emphasis for current faculty	
s. We changed our admissions criteria	
t. Other:	

Grove School of Engineering
Assessment Plan & Reports for Graduate Programs in Engineering
2011-2013

Department: Electrical Engineering
Department representative: Prof. Roger Dorsinville, Chair
Chair's signature:
Date Submitted:

Attach the Course vs. Program Outcomes Curriculum Matrices (Master's and PhD if applicable) to this report. Please answer all questions and make sure you can substantiate claims with documentation.

Assessment Report Academic Years 2011-2012

1. Please check your assessment activities in and before 2011-2012 and submit this page to Annita Alting, director of Institutional Effectiveness, Rm. T137 (Dean's Office) by June 22, 2012.

Activity	*Check*
Reviewed / developed program learning outcomes (PhD)	*x*
Reviewed / developed program learning outcomes (Master's)	*x*
Developed Curriculum Matrix / Map (PhD)	*x*
Developed Curriculum Matrix / Map (Master's)	*x*
Developed assessment tools for Doctoral assessment	*x*
Developed assessment tools for Master's assessment	
Reviewed / developed course learning outcomes and included them on syllabi	*partial*
Collected assessment data (PhD)	*x*
Collected assessment data (Masters)	
Analyzed and discussed assessment data (PhD)	*x*
Analyzed and discussed assessment data (Master's)	
Other:	

Use of assessment data for improvement in 2011-2013:	*Check*
a. We made changes in course content	
b. We made changes in course delivery and/or pedagogy	
c. We added and/or deleted courses	
d. We made changes in pre / co-requisites	
e1. We made changes in degree requirements (PhD)	
e2. We made changes in degree requirements (Master's)	
f. We made changes in the emphasis for new / vacant faculty positions	
h. We included assessment results in faculty meetings / retreats, curriculum committee meetings, etc.	*x*
i. We made changes in degree programs and the development of new degree program options	
j. We were able to justify past curriculum changes and show program improvement resulting from those changes	
k. We made changes in the advising processes	
l. We developed academic services for students	
m. We developed new career explorations and/or career services for students	
n. We made changes to student academic facilities such as labs and study areas	
o. We developed / improved academic and program information to students	
p. We shared assessment information with alumni and review/advising boards	
q. We further refined the assessment methods or implemented new assessment methods	
r. We made chamges in instructional / mentoring emphasis for current faculty	
s. We changed our admissions criteria	
t. Other:	

Assessment Plan Academic Year 2012-2013

Department: Electrical Engineering
Department representative: Prof. Roger Dorsinville, Chair
Chair's signature:
Date Submitted:

Please answer all questions and submit this plan to Annita Alting, Rm T137 (Dean's Office) by October 15, 2012.

1. Which Program Learning Outcome(s) do you plan to assess in 2012-2013? List Below:

Masters:

A. Apply knowledge of mathematics, science, and engineering to solve engineering problems
   1. Apply Mathematical techniques and skills to engineering problems
   2. Understand the underlying physical principles behind specific engineering devices and systems.
   3. Demonstrate strong computer programming and simulation skills
   4. Demonstrate the ability to utilize technical skills to design systems / components.

B. Demonstrate engineering expertise in an area of concentration in order to solve contemporary engineering issues
C. Communicate effectively both as individuals and leaders of multidisciplinary and multicultural teams in a diverse global economy
D. Recognize the need for and engage in life-long learning as independent professionals
E. Understand the importance of the ethical, safety,socio-economic, and environmental issues in the Electrical Engineering Profession.

PhD:

- Apply knowledge of mathematics, science, and engineering to solve engineering problems and undertake teaching and research;
  - *Qualifying Exam (form A):*
    - *The student is able to apply the fundamentals of Electrical Engineering to solve new problems;*
    - *The student is able to apply mathematical techniques and skills in solving Electrical Engineering problems;*
    - *The student is able to apply physical principles to solve Electrical Engineering problems;*
    - *The student comprehends specific topics of current interest in Electrical Engineering research;*
    - *The student shows potential for conducting Ph.D. level research.*
  - *Proposal (formB):*
    - *The student uses and applies such tools of research as are necessary to conduct research in the field (e.g., computer languages, novel experimental techniques, statistics, etc.,);*
- Demonstrate potential leadership skills to succeed in the profession;
  - *Progress review (form D):*
    - *Review of extracurricular activities, teaching, mentoring, etc.,*
- Communicate effectively both as individuals and leaders of multidisciplinary and multicultural teams in a diverse global economy;
  - *Proposal (Form B):*
    - *The student has written a clear, comprehensive, and accurate proposal describing the planned research for the Ph.D. degree;*
    - *The student is able to effectively present technical material to peers and faculty, orally and in writing.*
  - *Dissertation & defense:*
    - *Exam topics 5,7,8 (quality of writing, oral presentation, question answering)*
- Demonstrate the ability to engage in life-long learning as independent scholars;
  - *Dissertation & defense:*
    - *Exam topics 1, 2,3, 6 (problem statement, literature survey/bibliography and objectives & goals)*
- Understand the importance of the ethical, safety, socio-economic, and environmental issues related to the Electrical Engineering profession;
  - *Dissertation & Defense*
    - *Exam topic 4 (technical soundness, professional standards and implications of solution)*
  - *Progress review:*
    - *Review of participation in / awareness of ethical research conduct training and regulations.*

- Plan and conduct scholarly activities that make original contributions to the knowledge base in one or more areas of specialization within Electrical Engineering discipline;
    - *Proposal (Form B):*
        - *The student has identified a new research topic for the Ph.D. degree;*
        - *The student has evaluated and compared several solution methodologies and chosen an appropriate approach;*
        - *The student has written a clear, comprehensive, and accurate proposal describing the planned research for the Ph.D. degree.*
    - *Dissertation & Defense:*
        - *Exam topics 4, 9 (novelty of solution, publication record)*

2. Check all the assessment methods you plan to employ in 2012-2013 and the semester in which you will collect the data:

Direct Methods	***Fall 2012***	***Spring 2013***
PhD Qualifying Exam (see also 9. Other Comments)	*x*	
PhD Proposal	*x*	*x*
PhD Dissertation & Defense	*x*	*x*
Master's Thesis or Other Capstone Experience		
Course-embedded assessment of Program Learning Outcome(s)		
Lab reports		
Other Method:		

Indirect Methods	***Fall 2012***	***Spring 2013***
Student Course Survey		
Progress Review Form (PhD)	*x*	
Exit Survey or Interview		
Student-Faculty Mixer(s)		
Focus Group		
PhD program acceptance rates	*x (GSOE wide)*	
Job placements		
Alumni Feedback		
Employer Feedback		
Grade Analyses / Course or Exam Pass Rates	*x*	
Retention and Graduation Analyses	*x*	
Enrollment analysis (e.g., effect of admissions criteria)		
Other Method:		

3. Have you discussed your plans with the instructors of the courses that will be assessed?
Yes, and all PhD advisors were asked to evaluate progress with their PhD students over the Fall 2012 semester.

4. List the faculty members and/or departmental committee(s) who will participate in assessing the data:
EE Chairman prof. Dorsinville, PhD coordinator(s) Profs Xiao and Tian, Master's coordinator prof. Gross, curriculum committee, PhD exam committees, PhD student mentors. Courses taught by Prof. Gross , Dr. Camp and Prof Myung Lee will be assessed.

5.When will data collected in the Fall 2012 be analyzed? Early Spring 2013

6. When will data collected in the Spring 2013 be analyzed?
After finals, Late May / Early June 2013, part of it also for this interim report.

7. Who will write the 2012-2013 assessment report?
PhD and Master's coordinators, and Dir. of Inst. Effectiveness (draft),

8. When will the report be shared with stakeholders? ***(For 2013 only: please provide interim report by March 15, 2013, to Annita Alting, T137, for inclusion in Middle States PRR- see next pages)***
Interim report for PRR June 2013, final report Fall 2013 with other stakeholders

9. Other comments:

The Qualifying Exam can be considered a comprehensive evaluation of the ability of the student to "Apply knowledge of mathematics, science, and engineering to solve contemporary engineering problems", which is the first PLO of the Master's program and/or PhD coursework, whether completed at CCNY or elsewhere.

Assessment Report Academic Year 2012-2013

Department: Electrical Engineering
Department representative: Prof. Roger Dorsinville, Chair
Chair's signature:
Date Submitted:

Please answer all questions and submit this report to Annita Alting, Rm T137 (Dean's Office) by October 15, 2013. (For 2013 only: please provide interim report on the questions below by March 15, 2013, to Annita Alting, T137, for inclusion in Middle States Periodic Review Report due June 1, 2013)

I. Program Learning Outcomes (PLOs)

a. Which Program Learning Outcome(s) did you assess in 2012-13? List below or refer to the plan 2012-2013.

See Plan 2012-2013

b. How many PLOs have you assessed since this process began in Spring 2011?
List all below, including repeats:

We assessed all five program outcomes of the PhD program continuously since Spring 2011.

Of the Master's program, we are in the process of assessing:

A. Apply knowledge of mathematics, science, and engineering to solve engineering problems
   - A1 Apply Mathematical techniques and skills to engineering problems
   - A2 Understand the underlying physical principles behind specific engineering devices and systems.
   - A3 Demonstrate strong computer programming and simulation skills
   - A4 Demonstrate the ability to utilize technical skills to design systems / components.

B. Demonstrate engineering expertise in an area of concentration in order to solve contemporary engineering issues
C. Communicate effectively both as individuals and leaders of multidisciplinary and multicultural teams in a diverse global economy
D. Recognize the need for and engage in life-long learning as independent professionals
E. Understand the importance of the ethical, safety,socio-economic, and environmental issues in the Electrical Engineering Profession.

Of the PhD program we assessed all program outcomes through the three exams and advising progress forms.
c. How much data was collected for this report?

We assessed the results of the qualifying exam taken by 16 students in September 2012.
A total of 16 students took the second exam (proposal) and assessment forms were completed by on average 3.5 evaluators per student and 17 students took the third exam (thesis & defense), wich was assessed by on average 5.1 evaluators per student.
PhD students' progress was evaluated during November and December 2012. Progress forms completed by their mentors for 25 PhD students. The students also provided their own feedback and reflections on the forms.
Three courses in the Master's program were / are being assessed: Remote sensing, Project Management and Wireless Communications.
Engineering Management had 28 students who took the course in fall 2012, Remote Sensing has 9 enrolled in spring 2013, and Wireless Communications 17 in fall 2012.

d. What DIRECT EVIDENCE of student learning did you evaluate? Direct evidence refers to student work: essays, exams, presentations, performances, exhibitions, internships, portfolios, etc. (Please attach any rubrics or other evaluative tools.)

Course / Exam	N students (Masters/PhD)	Direct evidence
PhD Qualifying Exam	16	Students' completed exams (n=10 for outcome evaluation)
PhD Proposal	16	Written Proposal and presentation to a panel of experts in the field
PhD Dissertation / Defense	17	Written thesis and presentation to committee of experts in the field
Course: EE G6902, Remote Sensing-survey	6/2 (plus 1 undergrad)	Midterm and final exams, final team report, final team project
Course: ENGR 8500: Project Management	23/3 (plus 1 undergrad and 1 adv. crt.)	Homework assignments, class discussions, Weekly written and oral presentations of case studies, weekly team based assignments and project presentation. Final project and presentation.
Course: EE F6300, Wireless Communications	12/0	Midterm and final exams, final team report

e. Was your rubric for evaluating this material reliable? That is, were the scores relatively consistent for each trait among faculty evaluators?

The qualifying exams were evaluated on achievement of the learning outcomes by one evaluator. Before evaluation, specific questions were aligned with the learning outcomes and the scores on the questions were used to determine the student score on the learning outcome.
The PhD proposals and dissertation & defense were evaluated by four to five evaluators per student and in this case consistency could be determined. The proposal showed mostly consistent scoring, i.e., less than 2 pts difference between different evaluators of the same student. One student each (out of 16) received scores differing 2 pts on learning outcomes 3 (choice of method) and 4 (write and plan proposal). Two students out of 16 received scores differing 2 point between evaluators on outcome 1, the identification of a new research topic. This implies reasonable agreement beteen evaluators on the meaning and standards for each learning outcome.
Six of the dissertation & defense outcomes were also scored fairly consistently. Outcome 6, relevance of the bibliography, had six out of 17 students with evaluations differening 2 points. Outcome 2, literature survey, had 5 students with inconsistent scoring, and outcome 3, clear objectives & goals, showed that four out of 17 students had inconsistent scores. The inconsistent scores on the "literature" outcomes 2 and 6 may reflect differences in expertise among the evaluators more than a poor formulation of the outcome, but outcome 3 could benefit from being split up in its four subcomponents so they are scored independently.
The three courses were / are being assessed by their instructors, based on assignments, projects, presentations and exams/quizzes, aligned with the course and program outcomes.

f. What are your findings from direct evidence? How do they compare to earlier evaluations of direct evidence?
Since there were no earlier evaluations, comparisons with earlier evaluations cannot be made yet.

Course / Exam	Findings	Analysis and Follow-up
Qualifying Exam	All 16 students who took the exam in September 2012 passed. Ten exams were used for determining achievement of the learning outcomes. All students scored "4" or higher on all of the five learning outcomes.	Most of the learning outcomes were scored based on application of math, science and electrical engineering fundamentals. However, the potential to do PhD level work was often determined based on other observations, such as having published already, having obtained important research results, self-directedness and a high cum GPA in the coursework.
PhD Proposal	All 16 students received a score of "adequate" to "excellent" on each of the four learning outcomes.	Targets still need to be decided, for the average of each learning outcome across students, and

	Averaged accross students, the learning outcomes scores ranged from 4.3 to 4.5. Scoring was reasonably consistent among different evaluators of the same student. 75% of the students scored "4" or higher on each of the outcomes "identification of research topic", "choice of approach" and "written proposal". On "mastery of research tools", all except one student (94%) scored "4" or higher. There was one student with a score lower than 3.50 on more than one learning outcome.	for the percentage of students meeting each learning outcome at the desired level. Based on comments provided by evaluators on the scoring forms, a score of 3 (adequate) should often be interpreted as "barely passing". A target for each learning outcome could be 80% of students scoring "4" or higher and no scores lower than 3. A target for each student could be no more than one learning outcome with a score lower than 3.50.
PhD Dissertation / Defense	Scores on the nine learning outcomes ranged from "(barely) adequate" to "excellent", with one student scoring lower than "3" on each of the outcomes "problem statement", "literature survey" and "objectives and goals". The other six outcomes had no students scoring lower than 3. Averaged accross students, the learning outcomes scores ranged from 4.2 to 4.5. 82% of the students scored "4" or higher on seven of the nine outcomes, 88% did so on outcome 4 (solution), and 71% on outcome 9 (publications). Two students had scores lower than 3.50 on more than two learning outcomes.	Outcomes with inconsistent scoring (scores between evaluators of the same student differing 2 pts or more) need to be reviewed and more accrately formulated. A target for each learning outcome could be 80% of students scoring "4" or higher and no scores lower than 3. A target for each student could be no more than two learning outcomes with a score lower than 3.50.
EE G6902, Remote Sensing - survey (Gross)	in progress, see appendix for preliminary findings and assessment approach	
ENGR G8500, Proj. Management (Camp)	in progress, see appendix for preliminary findings and assessment approach	
EE F6300, Wireless Communications	in progress, see appendix for preliminary findings and assessment approach	

g. What INDIRECT EVIDENCE did you use? Indirect evidence includes students' reflections on their own learning in the form of surveys, questionnaires, focus groups, and one-minute essays as well as other evidence, such as admission rates to graduate programs, career placement rates, voluntary gifts from alumni, etc. (Please attach surveys, focus group or essay questions, etc.)

A first analysis of retention of PhD students starting at CCNY since fall 2008 through fall 2010, shows that of the 33 students 28 (85%) were still in the program as of fall 2012 and none had graduated yet. All 28 were in good academic standing (cum. GPA 3.00 or higher). Of the five not retained, three graduated with a Master's degree, one left in excellent academic standing to complete his degree (probably, from transcript request) elsewhere and one could not maintain good academic standing.

Twenty-five PhD students met with their mentors at the end of the fall 2012 semester, to review their progress and accomplishments and plan for the next semester. Together with their mentor they answered six questions and gave their own feedback. All students had satisfactory progress and had positive feedback on their experience. More details are provided in the next section.

h. What are your findings from indirect evidence? How do they compare to earlier results?
Since there were no earlier evaluations, comparisons with earlier evaluations cannot be made yet.

Question	Findings
What progress has your student made in the previous semester toward the Ph.D.? (e.g., courses and exams taken and passed, lectures, field trip for data collection, etc.,).	All 25 students had satisfactory progress in fall 2012. They showed progress in at least one of the categories: course(s) completed, exams passed, internal presentations given, research, field trips, publications in progress. The six students with progress in only one area, were concentrating on research (4), passing an exam (1) and preparing a publication (1).
Please state any important accomplishments your student has made during the previous semester (e.g., oral or poster presentation at a conference, paper in journal, course instruction, research progress, thesis progress, etc.,)	The mentors mentioned at least one important accomplishment for 21 of the 25 students. Of the remaining four, two students just started, one student is in the last phase of the Ph.D., and one had no main accomplishments due to family circumstances. Important accomplishments can be: teaching a course (28%), having a paper accepted/submitted (72%), presenting at a conference (28%), and important research progress (36%).
What extracurricular activities has your student been involved in which demonstrate leadership skills? (e.g., supervising student research, mentor/teach undergraduate/high school students, participate/mentor competition teams, student clubs, etc.,).	Seventeen students (68%) demonstrated leadership skills in the fall 2012 semester, through teaching, mentoring, active participation in student organizations and professional activities.
Did your student review and demonstrate an understanding of the material regarding he importance of the ethical, safety, socio-economic and environmental issues and be compliant with the regulations regarding responsible conduct of research? (e.g., IEEE ethic code, safety training, RCR workshop, IRB certification, etc.)	Twenty four (97%) students are considered at least aware of responsible research conduct, and examples to support this were mentioned for 17 (68%) students. The question was not answered for one student.
If applicable, what courses will your student take in the next semester? How will these courses help in his/her research and/or career pursuits?	Ten students plan on taking one or more courses the next semester, fifteen on carrying out research, and eight on working on their thesis. Five plan both coursework and research in the next semester, and five others research and thesis writing. Two have no specific plans but to increase their skills in preparation for their research.
Your advice to the student about the professional development plan for the next semester....	analysis in progress
Student Feedback: Please have your student provide his/her opinion on their progress and overall experience.	analysis in progress

II. Course Learning Outcomes

a. What percentage of full-time faculty members complied with your request to submit syllabi with Course Learning Outcomes (CLOs) in the spring of 2013?

tbd

b. What was the annual (2012-13) percentage of compliance?

tbd

c. Are faculty proficient in composing CLOs? Are they able to align their CLOs with the PLOs? If not, how do you plan to address issues of faculty compliance and competence in this area?
Because of their experience with ABET, all faculty know how to compose CLOs and align CLOs with the PLOs. If the anaysis of learning outcomes on syllabi shows any need for improvement this will be addressed by the director of institutional effectiveness and/or the graduate coordinators. The EE faculty has generally been very open to suggestions and advice on assessment matters.

III. 2012-13 Assessment Plan vs. 2012-13 Assessment Report

a. Have you deviated from the 2012-13 Assessment Plan? If so, how—and why?

No.

IV. Recommendations and Actions

a. When will you share the 2012-13 assessment report with stakeholders? What opportunities will you or your Chair provide for faculty to discuss the findings?

Early fall 2013, in graduate curriculum meetings and faculty meetings.

b. Are you piloting any new courses or proposing any curricular changes, minor or major, based on your assessment thus far? If so, please describe and fill out the checklist below.

Use of assessment data for improvement in 2012-2013:	***Check***
a. We made changes in course content	
b. We made changes in course delivery and/or pedagogy	
c. We added and/or deleted courses	
d. We made changes in pre / co-requisites	
e1. We made changes in degree requirements (PhD)	
e2. We made changes in degree requirements (Master's)	
f. We made changes in the emphasis for new / vacant faculty positions	
h. We included assessment results in faculty meetings / retreats, curriculum committee meetings, etc.	*x*
i. We made changes in degree programs and the development of new degree program options	
j. We were able to justify past curriculum changes and show program improvement resulting from those changes	
k. We made changes in the advising processes	*x*
l. We developed academic services for students	
m. We developed new career explorations and/or career services for students	
n. We made changes to student academic facilities such as labs and study areas	
o. We developed / improved academic and program information to students	*x*
p. We shared assessment information with alumni and review/advising boards	*x*
q. We further refined the assessment methods or implemented new assessment methods	*x*
r. We made chamges in instucttional / mentoring emphasis for current faculty	*x*
s. We changed our admissions criteria	
t. Other:	

APPENDIX. EE Department Assessment Approach and Results (preliminary) for Masters Sp 2013

In assessing the Masters program, we are relying fundamentally on the lecture courses that the students are taking. In addition, to better isolate the problem areas in the more technical area, we have broken up Program Outcome A into 4 sub-outcomes as depicted below.

A. Apply knowledge of mathematics, science, and engineering to solve engineering problems

- A1 Apply Mathematical techniques and skills to engineering problems
- A2 Understand the underlying physical principles behind specific engineering devices and systems.
- A3 Demonstrate strong computer programming and simulation skills
- A4 Demonstrate the ability to utilize technical skills to design systems / components.

B. Demonstrate engineering expertise in an area of concentration in order to solve contemporary engineering issues

C. Communicate effectively both as individuals and leaders of multidisciplinary and multicultural teams in a diverse global economy

D. Recognize the need for and engage in life-long learning as independent professionals

E. Understand the importance of the ethical, safety,socio-economic, and environmental issues in the Electrical Engineering Profession.

For this assessment, we have focused on the following courses

1. EE G6902 (Earth Surveillance 6 Masters Students) Sp 2013
2. EE F6300 (Wireless Communications 12 masters) Fall 2012
3. Engr 8500 (Project Management 19 Masters) Fall 2012

The general approach is as follows

1. Assign course outcomes and determine which assessment tools are being used.
2. Determine which assessment tools address each course outcome and which Program outcome is addressed by the particular assessment tool (see section xxx)
3. Assign weights to each assessment tool based on the instructor grading system
4. Determine in a quantitative way for each student the effective numerical performance from each program outcome as $\frac{\sum_i w_i \, S_i}{\sum_i w_i}$ where w_i is the weight assigned to the i^{th} assessment tool and S_i is the score of the assessment tool.
5. A threshold for each outcome is determined and statistics of exceeding or meeting expectations is determined.

It should be pointed out that the Project Management course is not technical in the strict sense and is only being used for Outcomes C,D and E. Also, the matrix approach we used for the technical courses is not used for the project management course.

EE F6300 Assessment Tools

Exams (midterm and final). Ex: E1P2 (Midterm Exam, Problem 2), E2P3 (Final Exam, Problem 3)

Final Team Report(FR), Final Team Project (FP)

Course Outcomes	A1	A2	A3	A4	B
Understanding of the evolution of cellular technologies	E1P5, E1P1				
Analysis of cellular system topologies	E1P2	E1P3, E1P4		E1P4	
Analysis of capacity of cellular system	E1P2	E1P2			
Understanding of co-channel interference and adjacent channel interference		E1P4		E1P2, E1P3, E1P4	
Understanding the tradeoff issues in capacity improvement technqiues	E1P2	E1P2		E1P3, E1P5	
Understanding/analysis of Large scale fading models and theie applications		E1P3			
Understanding/analysis Small scale fading models and their applications (multipath, Doppler)	E2P1, E2P2	E2P1, E2P2, E2P6			
Digital modulation and its performance analysis		E2P6			
Understanding/Analysis of optimal filters		E2P3, E2P4			
Understanding/Analysis of Direct Sequence Spread Spectrum System and Frequency Hopping System.		E2P4			
Understanding/Analysis of Multiple access techniques	E2P5				
Understanding/Simulation of a CDMA communication system with additive and multiplicative noise	FP	FP	FP	FP	FP

EE F6300 Course Weights and Program Evaluation by student.

	E1P1	E1P2	E1P3	E1P4	E1P5	E2P1	E2P2	E2P3	E2P4	E2P5	E2P6	FP					
Course Weights	4%	8%	12%	8%	8%	8%	8%	8%	6%	4%	6%	20%					
	4%	8%	12%	8%	8%	8%	8%	8%	6%	4%	6%	20%					
	4%	8%	12%	8%	8%	8%	8%	8%	6%	4%	6%	20%					
	4%	8%	12%	8%	8%	8%	8%	8%	6%	4%	6%	20%					
	4%	8%	12%	8%	8%	8%	8%	8%	6%	4%	6%	20%					
	4%	8%	12%	8%	8%	8%	8%	8%	6%	4%	6%	20%					
	4%	8%	12%	8%	8%	8%	8%	8%	6%	4%	6%	20%					
	4%	8%	12%	8%	8%	8%	8%	8%	6%	4%	6%	20%					
	4%	8%	12%	8%	8%	8%	8%	8%	6%	4%	6%	20%					
	4%	8%	12%	8%	8%	8%	8%	8%	6%	4%	6%	20%					
	4%	8%	12%	8%	8%	8%	8%	8%	6%	4%	6%	20%					
							8%	8%	6%	4%	6%	20%					
													A1	A2	A3	A4	B
Student #1	0.50	0.60	0.37	0.40	0.60	0.65	0.75	0.80	0.40	1.00	0.80	0.60	0.65	0.59	0.60	0.52	0.60
Student #2	0.20	0.15	0.47	0.15	0.30	0.15	0.55	0.30	0.47	1.00	0.13	0.40	0.37	0.33	0.40	0.33	0.40
Student #3	0.00	0.35	0.53	0.60	0.40	0.60	0.45	0.30	0.33	1.00	0.27	0.55	0.49	0.47	0.55	0.50	0.55
Student #4	0.60	0.55	0.33	0.55	0.55	0.40	0.65	0.00	0.33	1.00	0.53	0.40	0.53	0.41	0.40	0.45	0.40
Student #5	0.40	0.30	0.30	0.55	0.30	0.35	0.60	0.40	0.33	0.20	0.67	0.50	0.41	0.44	0.50	0.41	0.50
Student #6	1.00	0.45	0.67	0.45	0.25	0.30	0.55	0.20	0.47	1.00	0.33	0.55	0.52	0.47	0.55	0.50	0.55
Student #7	0.40	0.50	0.50	0.65	0.35	0.45	0.75	0.00	0.47	0.70	0.47	0.60	0.55	0.50	0.60	0.54	0.60
Student #8	0.20	0.70	0.67	0.15	0.65	0.70	0.50	0.80	0.73	0.80	0.80	0.25	0.49	0.54	0.25	0.45	0.25
Student #9	1.00	0.65	0.60	1.00	0.40	0.45	0.60	0.60	0.67	0.70	0.67	0.60	0.59	0.64	0.60	0.64	0.60
Student #10	0.50	0.50	0.73	0.20	0.35	0.70	0.70	1.00	0.40	0.90	0.67	0.70	0.63	0.64	0.70	0.56	0.70
Student #11	0.40	0.60	0.83	1.00	0.25	0.65	0.80	1.00	0.53	0.60	0.53	0.50	0.54	0.70	0.50	0.62	0.50
Student #12	0.10	0.30	0.50	0.40	0.15	0.25	0.40	0.40	0.40	0.70	0.40	0.20	0.27	0.32	0.20	0.30	0.20
													Program Outcome values				
													9/11 exceed				

EE G6902 Assessment Tools								
Exams (midterm and final). Ex: E1P2								
Final Team Report(FR), Final Team Project (FP)								
Course Outcomes	A1	A2	A3	A4	B	C	D	E
Understanding Basics of Optics	E1P1	E1P1		E1P1				
Understanding Radiometric Quantities	E1P2,E1P3	E1P2,E1P3						
Basics or Miultispectral Remote Sensing		E1P4						
Black Body Radiation	E1P5,E1P6,E1P8	E1P8						
Understanding Atmospheric effects on Satellite Observations	E1P9							
Understand Noise and how to account for noise in interpreting measurements								
Learn to approximate answers to challenging technical problems	E1P3	E1P3						
Integrate Theory into System Design to Meet Specifications					FR,FP		FR,FP	FR,FP
Be able to understand real world costs and constraints						FR,FP	FR,FP	FR,FP
Work as a team including division of Labor						FR		
Present work authoritatively						FR,FP		
Present work authoritatively						FP		

EE G6902 Course Weights and Program Evaluation by student.

	E1P1	E1P2	E1P3	E1P4	E1P5	E1P6	E1P7	E1P8	E1P9	E2	FR	FP	A1	A2	A3	A4	B	C	D	E
Course Weights	2.88	1.92	2.88	2.88	1.92	2.88	2.88	1.92	4.81		25.00	25.00								
	2.88	1.92	2.88	2.88	1.92	2.88	2.88	1.92	4.81		25.00	25.00								
	2.88	1.92	2.88	2.88	1.92	2.88	2.88	1.92	4.81		25.00	25.00								
	2.88	1.92	2.88	2.88	1.92	2.88	2.88	1.92	4.81		25.00	25.00								
	2.88	1.92	2.88	2.88	1.92	2.88	2.88	1.92	4.81		25.00	25.00								
	2.88	1.92	2.88	2.88	1.92	2.88	2.88	1.92	4.81		25.00	25.00								
	13.75	10.00	13.88	15.00	10.00	15.00	15.00	10.00	4.00											
	12.50	10.00	9.00	0.00	6.33	11.63	0.00	7.50	5.00											
	13.75	10.00	7.50	11.25	10.00	5.72	13.65	3.75	13.50											
	6.25	10.00	3.75	10.50	6.67	8.25	9.00	10.00	13.00											
	13.75	10.00	12.75	15.00	10.00	15.00	0.00	10.00	0.00											
	15.00	2.50	9.38	9.00	10.00	13.99	5.40	8.75	19.50											
Student #1	91.67	100.00	92.50	100.00	100.00	100.00	100.00	100.00	16.00				76.63	96.35		91.67				
Student #2	83.33	100.00	60.00	0.00	63.33	77.50	0.00	75.00	20.00				61.96	60.00		83.33				
Student #3	91.67	100.00	50.00	75.00	100.00	38.13	91.00	37.50	54.00				64.22	71.15		91.67				
Student #4	41.67	100.00	25.00	70.00	66.67	55.00	60.00	100.00	52.00				57.92	62.31		41.67				
Student #5	91.67	100.00	85.00	100.00	100.00	100.00	0.00	100.00	0.00				71.50	94.62		91.67				
Student #6	100.00	25.00	62.50	60.00	100.00	93.25	36.00	87.50	78.00				79.11	68.65		100.00				
													Program Outcome values							

Engr G8500 Assessment Tools and Results

COURSE OUTCOMES AND PROGRAM CRITERIA

COURSE #: ENGR 8500	CATALOG DESCRIPTION:
COURSE TITLE: Project Management	This course investigates the increasing use of projects to accomplish
CATEGORY: ENGINEERING MANAGEMENT	important organizational goals and the unique style of administration
TERM OFFERED: Fall 2010,2011,2012	required to manage them. The course focuses both on science of project
PRE-REQUISITES: Bachelors Degree	management and the art of managing projects. To illustrate and reinforce
PRE/CO-REQUISITES: N/A	course concepts, a variety of projects, organizational settings, and issues
ACADEMIC LOAD:	will be investigated through case studies. Topics to be addressed include
COURSE COORDINATOR: Prof. Camp	the selection of projects, the role of the project manager, how to organize

MASTERS' PROGRAM OUTCOMES	**A:** Apply knowledge of mathematics, science, and engineering to solve engineering problems. **B:** Demonstrate engineering expertise in an area of concentration in order to solve the contemporary **C:** Communicate effectively both as individuals and leaders of multidisciplinary and multicultural tean **D:** Recognize the need for and engage in life-long learning as independent professionals. **E:** Understand the importance of the ethical, safety, socio-economic, and environmental issues in th
POSSIBLE ASSESSMENT TOOLS	**AT 1:** Homework assignments and class discussions. **AT 2:** Weekly written and oral presentations of case studies. **AT 3:** Weekly team based assignments, and project presentation. **AT 4:** Final project and presentation.
COURSE OUTCOMES	**[CO1]** Clear understanding of how project management is different from management in general. . **[CO2]** Knowledge of the tools of project management and competence in using them. **[CO3]** Competence in understanding where Project Management is needed and used in engineering **[CO4]** Team work experience from effective c **[CO5]** Writing and presentation skills..

OURSE OUTCOMES: Links shown marked with a letter correspond to the **MASTERS' PROGRAM OUTCOME** that applies.

	A	B	C	D	E	% Meeting Expectation
CO1			AT2	AT1		69%
CO2				AT1		90%
CO3					AT1	100%
CO4			AT3			100%
CO5			AT2,AT 3,AT4			87%
Meeting Expectations by Program Outcome			85%	79.50%	100%	

The above preliminary assessment using the following three classes can be broken up into the following 2 sets

1) The technical outcomes as measured by 2 courses illustrates that for A1-A4, B, we are meeting expectations fairly evenely (9/11) for F6300 and (5/6) for G6902. G6902 evaluation is still ongoing with end of semester projects
2) Regarding the "soft" skills (C,D,E) as assessed using G8500 (Project Management), it seems that the main issue which requires further investigation is out come D (Recognize the need for and engage in life-long learning as independent professionals).

Grove School of Engineering
Assessment Plan & Reports for Graduate Programs in Engineering
2011-2013

Department: Mechanical Engineering
Department representative: Prof. Andreopoulos (PhD programs), Prof. Bapat (Master's programs), Prof. Delale (Chair)
Chair's signature: Feridun Delale
Date Submitted: April 16, 2013

Attach the Course vs. Program Outcomes Curriculum Matrices (Master's and PhD if applicable) to this report. Please answer all questions and make sure you can substantiate claims with documentation.

Assessment Report Academic Year 2011-2012

1. Please check your assessment activities in and before 2011-2012 and submit this page to Annita Alting, director of Institutional Effectiveness, Rm. T137 (Dean's Office) by June 22, 2012.

Activity	*Check*
Reviewed / developed program learning outcomes (PhD)	*x*
Reviewed / developed program learning outcomes (Master's)	*x*
Developed Curriculum Matrix / Map (PhD)	*x*
Developed Curriculum Matrix / Map (Master's)	*x*
Developed assessment tools for Doctoral assessment	*x*
Developed assessment tools for Master's assessment	*x*
Reviewed / developed course learning outcomes and included them on syllabi	*partial*
Collected assessment data (PhD)	*x*
Collected assessment data (Masters)	*x*
Analyzed and discussed assessment data (PhD)	*x*
Analyzed and discussed assessment data (Master's)	*x*
Other: Evaluation of Nuclear Engineering Concentration for Funding Agency	*x*

Use of assessment data for improvement in 2011-2012:	***Check***
a. We made changes in course content	*x*
b. We made changes in course delivery and/or pedagogy	
c. We added and/or deleted courses	*x*
d. We made changes in pre / co-requisites	*x*
e1. We made changes in degree requirements (PhD)	
e2. We made changes in degree requirements (Master's)	
f. We made changes in the emphasis for new / vacant faculty positions	
h. We included assessment results in faculty meetings / retreats, curriculum committee meetings, etc.	
i. We made changes in degree programs and the development of new degree program options	*x*
j. We were able to justify past curriculum changes and show program improvement resulting from those changes	
k. We made changes in the advising processes	
l. We developed academic services for students	
m. We developed new career explorations and/or career services for students	
n. We made changes to student academic facilities such as labs and study areas	
o. We developed / improved academic and program information to students	
p. We shared assessment information with alumni and review/advising boards	
q. We further refined the assessment methods or implemented new assessment methods	*x*
r. We made chamges in instucttional / mentoring emphasis for current faculty	
s. We changed our admissions criteria	
t. Other: Published paper in Advances in Engineering Education about a systemic reform of the Mechanical Engineering program at CCNY: " Infusion of Emerging Technologies and New Teaching Methods into The Mechanical Engineering Curriculum at The City College of New York". (Delale, Liaw, Jiji, Voicolescu and Yu). The paper describes the NSF funded project and outcomes assessment results gained from ABET mandated learning outcomes assessments.	*x*

Assessment Plan Academic Year 2012-2013

Department: Mechanical Engineering
Department representative: Prof. Andreopoulos, Prof. Bapat
Chair's signature: Yeridun Delale
Date Submitted: April 16, 2013

Please answer all questions and submit this plan to Annita Alting, Rm T137 (Dean's Office) by October 15, 2012.

1. Which Program Learning Outcome(s) do you plan to assess in 2012-2013? List Below:

PhD:

I. Apply knowledge of mathematics, science, and engineering to solve engineering problems and undertake teaching and research;

Qualifying Exam (form A): *-The student is able to apply the fundamentals of Mechanical Engineering to solve new problems;*
- The student is able to apply analytical skills in solving Mechanical Engineering problems;
- The student shows potential for conducting Ph.D. level research.
Proposal (FormB): *- The student uses and applies such tools of research as are necessary to conduct research in the field (e.g., computer languages, novel experimental techniques, statistics, etc.,);*

II. Demonstrate potential leadership skills to succeed in the profession *(not yet assessed).*

III. Communicate effectively both as individuals and leaders of multidisciplinary and multicultural teams in a diverse global economy;
Proposal (Form B): *- The student has written a clear, comprehensive, and accurate proposal describing the planned research for the Ph.D. degree;*
- The student is able to effectively present technical material to peers and faculty, orally and in writing.
Dissertation & defense *- Exam topics 5,7,8 (quality of writing, oral presentation, question answering)*

IV. Demonstrate the ability to engage in life-long learning as independent scholars;
Dissertation & defense *- Exam topics 1, 2,3, 6 (problem statement, literature survey/bibliography and objectives & goals)*

V. Understand the importance of the ethical, safety, socio-economic, and environmental issues related to the Mechanical Engineering profession;
Dissertation & Defense *- Exam topic 4 (technical soundness, professional standards and implications of solution)*

VI. Plan and conduct scholarly activities that make original contributions to the knowledge base in one ore more areas of specialization within Mechanical Engineering discipline.
Proposal (Form B): *- The student has identified a new research topic for the Ph.D. degree;*
- The student has evaluated and compared several solution methodologies and chosen an appropriate approach;
- The student has written a clear, comprehensive, and accurate proposal describing the planned research for the Ph.D. degree.
Dissertation & Defense *- Exam topics 4, 9 (novelty of solution, publication record)*

Master's:

A. Apply knowledge of mathematics, science and engineering to solve contemporary engineering problems. ***
B. Provide engineering expertise to solve community, regional, national and global problems. *
C. Communicate effectively as individuals and as leaders of multidisciplinary teams in a diverse global economy *(not assessed yet)*
D. Recognize the need for and engage in life-long learning as independent professionals. **
E. Engage in highly ethical and professional practices that account for the global, environmental and societal impact of engineering decisions. *(not assessed yet)*

*Note. * Some of the assessed courses addressed the outcome weakly, the others not at all. ** One course addressed the outcome strongly. *** All assessed courses addressed the outcome strongly. Outcome C & E were not assessed.

2. *Check all the assessment methods you plan to employ in 2012-2013 and the semester in which you will collect the data:*

Direct Methods	*Fall 2012*	*Spring 2013*
PhD Qualifying Exam	x	
PhD Proposal	x	x
PhD Dissertation & Defense	x	x
Master's Thesis or Other Capstone Experience		
Course-embedded assessment of Program Learning Outcome(s)	x	
Lab reports		
Other Method:		

Indirect Methods	***Fall 2012***	***Spring 2013***
Student Course Survey		
Progress Review Form (PhD)		
Exit Survey or Interview		
Student-Faculty Mixer(s)		
Focus Group		
PhD program acceptance rates		
Job placements		
Alumni Feedback		
Employer Feedback		
Grade Analyses / Course or Exam Pass Rates	x	x
Retention and Graduation Analyses		x
Enrollment analysis (e.g., effect of admissions criteria)		
Other Method: Evaluation of long-termNSF funded project "Bridges to Engineering. Success for Transfers" - report to NSF, paper in progress to 2013 annual ASEE conference, Atlanta.	x	x

3. *Have you discussed your plans with the instructors of the courses that will be assessed?*

Yes, in several faculty meetings, in which the director of Institutional Effectiveness was invited.

4. *List the faculty members and/or departmental committee(s) who will participate in assessing the data:*

Prof. Delale (Chair), Prof. Andreopoulos (Ph.D. advisor), Prof. Bapat (Master's advisor), Profs. Jiji, Liaw, Andreopoulos, Ganatos and Elvin (course assessments); PhD mentors, Ph.D. exam committees (proposal and thesis & defense).

5. *When will data collected in the Fall 2012 be analyzed?*

Early Spring 2013.

6. *When will data collected in the Spring 2013 be analyzed?*

Early Fall 2013.

7. *Who will write the 2012-2013 assessment report?*

Prof. Delale and Dr. Alting

8. *When will the report be shared with stakeholders?* ***(For 2013 only: please provide interim report by March 15, 2013, to Annita Alting, T137, for inclusion in Middle States PRR- see next page)***

Fall 2013.

9. Other comments:

Although this assessment report focuses mainly on the Master's and Ph.D. programs in Engineering, the Mechanical Engineering department takes pride in its strong tradition of curriculum improvement in its undergraduate programs and success in obtaining funding for significant educational projects. Evaluation and assessment is an integral part of these projects. A sample of some early and more recent initiatives:

- Ecsel (Engineering Coalition of Schools for Excellence in Education and Leadership), promoting the concept of "Design Accross the Curriculum" (early 1990s. PI for CCNY: Dagan)
- Home Experiments in Mechanical Engineering (http://www-me.engr.ccny.cuny.edu/homeexp/homexp.html) (mid 1990s. PIs: Jiji, Delale and Liaw)
- Systemic Reform of Mechanical Engineering Curriculum (late 1990s, early 2000s. PI: Delale)
- Bridges to Engineering. Success for Transfers (2004-2012. PIs: Barba, Delale)
- Nuclear Engineering Concentration in Mechanical Engineering(2010-2012. PIs: Andreopoulos, Kawaji)
- CILES - Alliance for Continuous Innovative Learning Environments in STEM- (present. PI: Gonzalez)
- PPOHA - Opportunities for Hispanic Americans (present. PI: Gonzalez)

From: " Infusion of Emerging Technologies and New Teaching Methods into The Mechanical Engineering Curriculum at The City College of New York". (Delale, Liaw, Jiji, Voicolescu and Yu).

" The Mechanical Engineering Department, as many departments in the country, is engaged in a continuing effort to review and upgrade its curriculum. The impetus for this has always been the ever-changing nature of the profession. However, in recent years a confluence of circumstances has accelerated these changes, requiring urgent and comprehensive curriculum reform. There are two distinct currents that are driving ME programs to reform their curricula.

- First, is the emergence of new technologies that are revolutionizing the practice of engineering. The miniaturization of mechanical devices, the advent of nanotechnology, the advances in information technologies, the emergence of intelligent systems, the introduction of new and advanced materials, the development of sophisticated software and finally the revolution in biology cannot be ignored in designing a modern mechanical engineering curriculum.....
- The second current compelling reform is the new trend in pedagogy that is gaining currency among science and engineering educators. According to this reform movement, engineering education must take into consideration industry needs, must be based on cognitive science, and should promote technological literacy.

.....

At the time of implementation the Mechanical Engineering department at the City College had 17 full time faculty members, 16 of whom participated in the reform effort. Since its completion, the reformed curriculum affects approximately 350 mechanical engineering majors yearly.

.....

Also, we are cognizant of the fact that many ME programs are undertaking similar efforts to introduce emerging technologies and new teaching methodologies into their curricula, and could benefit from our experiences as described in this paper."

Assessment Report Academic Years 2011-2013

Department: Mechanical Engineering
Department representative: Prof. Andreopoulos, Prof. Bapat
Chair's signature: Feridun Delale
Date Submitted: April 16, 2013

Please answer all questions and submit this report to Annita Alting, Rm T137 (Dean's Office) by October 15, 2013. (For 2013 only: please provide interim report on the questions below by March 15, 2013, to Annita Alting, T137, for inclusion in Middle States Periodic Review Report due June 1, 2013)

I. Program Learning Outcomes (PLOs)

a. Which Program Learning Outcome(s) did you assess in 2011-13? List below or refer to the plan 2012-2013.

see plan

b. How many PLOs have you assessed since this process began in Spring 2011? ***Eleven***
List all below, including repeats: ***see plan***

c. How much data was collected for this report?

Master's Program / PhD level 1: From fall 2011 through fall 2012, six courses were assessed on the course learning outcomes related to the program outcomes mentioned under I.a. Participation ranged from 8 to 37 students per course. Both Master's and PhD students attended, and on occasion also advanced undergraduate students with permission to take a Master's level course. A fair amount of students from other Engineering majors took the courses as well.

Doctoral Program: Some students taking the first exam (qualifying exam) and all students taking the second exam (proposal) and third exam (dissertation & defense) were evaluated using "exam forms" on which the evaluators scored the candidate on each of the learning outcomes for the exam. Over the period Spring 2011-Spring 2013, Three students were assessed on the qualifying exam, eleven students submitted the proposal and seven students submitted and defended their thesis.

d. What DIRECT EVIDENCE of student learning did you evaluate? Direct evidence refers to student work: essays, exams, presentations, performances, exhibitions, internships, portfolios, etc. (Please attach any rubrics or other evaluative tools.)

Course / Exam	N students (Masters/PhD)	Direct evidence
ME I6200, Advanced Mechanical Vibrations (A, B, D)	(12/10), plus1 undergrad	students' homework, mid-term and final exams, classroom discussion, and office-hour consultation
ME G4000, Applied Stress Analysis (A,B,D)	(29/4), plus 1 undergrad	students' homework, finite-element projects, mid-term and final exams, classroom discussion, and office-hour consultation
ENGR I6400, Wave Propagation in Solids (A, B, D)	(4/7)	students' homework, finite-element projects, classroom discussion, and office-hour consultation
ENGR I1100, Engineering Analysis (A,D)	(32/5)	student homework, midterm exam and final exam
ENGR I1400, Applied Partial Differental Equations (A)	(2/12)	students' homework, mid-term and final exams, classroom discussion, and office-hour consultation
ME I3700, Convection Heat Transfer (A, D)	(3/5)	students' homework, finite-element projects, classroom discussion, and office-hour consultation
PhD Qualifying Exam (I)	3	Student work
PhD Proposal (I, III, VI)	11	Written Proposal and presentation to a panel of experts in the field
PhD Dissertation / Defense (III, IV, V, VI)	7	Written thesis and presentation to committee of experts in the field

Note. ENGR I1100 and ENGR I1400 have significant participation of students from other engineering majors. E.g., ENGR I1100 had 8 EE and 6 BME Master's students enrolled, and ENGR I1400 had 5 ChE PhD students enrolled.

e. Was your rubric for evaluating this material reliable? That is, were the scores relatively consistent for each trait among faculty evaluators?

Assignments, projects, and/or exam questions were aligned with the course learning outcomes and graded to obtain a class average for each course learning outcome, which was then classified as "Strong Knowledge" (strong achievement of course learning outcome), "Partial Knowledge" (some achievement of course learning outcome but there is room for improvement), and "No Knowledge" (unsatisfactory achievement of course learning outcome). Since there was only one evaluator for each course, consistency between evaluators was not determined. The qualifying exams were also evaluated by one evaluator.

The PhD proposals and dissertation & defense were evaluated by three to five evaluators per student and in this case consistency could be determined.
The proposal showed generally consistent scoring on the four of the five learning outcomes, but "effective communication skills" had four out of eleven students with evaluations differing two or more points between evaluators. The "ability to write a successful research proposal" was scored most consistently, with no students with inconsistent eveluations. The remaining three had each one student with an inconstent evaluation. In fact, there appeared to be significant variation between evaluators on four of the five learning outcomes for one particular student. The "communication skills" outcome is probably formulated too broadly, encompassing oral and written presentation skills to peers and faculty, that might benefit from being evaluated independently.
The dissertation & defense outcomes were all scored fairly consistently. Outcomes 1,2,3 and 6 had no inconsistent scores, outcome 5 had one student (out of 7) with scores ranging from 3 to 5, and outcomes 4, 7, 8 and 9 had two students each with scores ranging from 3 to 5.

f. What are your findings from direct evidence? How do they compare to earlier evaluations of direct evidence?

Course / Exam	Findings	Analysis and Follow-up
ME I6200, Advanced Mechanical Vibrations - Liaw (**A**, B, D)	On average, students showed strong achievement of three of the four course outcomes. The fourth course outcome, covering more complex vibrational behaviors in "real-life" situations, was on average "partially" achieved.	1. Decide on targets for each learning outcome (e.g., in the context of the program outcomes, is "partial achievement" sufficient or is improvement needed? If so, what improvements? If not, does it fall under program outcome D and do students realize the need for life-long learning? 2. Decide on the minimum percentage of students we wish to see achieving each learning outcome at the desired level. 3. In future assessments, compare with student feedback.
ME G4000, Applied Stress Analysis - Liaw (**A**,B,D)	On average, students showed strong achievement of two of the three course outcomes. The third course outcome, covering applications of analysis techniques to practical design problems, was on average "partially" achieved.	see above.
ENGR I6400, Wave Propagation in Solids - Liaw (**A**, B, D)	On average, students showed strong achievement of three of the four course outcomes. The fourth course outcome, covering application of FE programs and comparing the findings to theoretical solutions, was on average "partially" achieved.	see above.
ENGR I1100, Engineering Analysis - Elvin (**A**,D)	On average, students showed strong achievement of three of the four course outcomes. The fourth course outcome, covering appreciation of the role of differential equations in engineering practice, was on average "partially" achieved.	1. Decide on targets for each learning outcome (e.g., in the context of the program outcomes, is "partial achievement" sufficient or is improvement needed? If so, what improvements? If not, is there a follow-up course in which the outcome will be addressed again? e.g., "Applied Differential Equations?" 2. Decide on the minimum percentage of students we wish to see achieving each learning outcome at the desired level. 3. In future assessments, compare with student feedback.
ENGR I1400, Applied Partial Differental Equations - Ganatos (**A**)	On average, students showed strong achievement of five of the six course outcomes. The fifth course outcome, covering methods for the solution of mixed boundary	see above. Considering the learning outcomes, this course does not offer a further exploration of the "partially" achieved fourth learning outcome of the previous course. Would this be worth considering and/or feasible?

	value problems, was on average "partially" achieved.	
ME I3700, Convection Heat Transfer - Jiji (**A, D**)	On average, students showed strong achievement of all four course outcomes.	1. Decide on targets for each learning outcome. 2. Decide on the minimum percentage of students we wish to see achieving each learning outcome at the desired level. 3. In future assessments, compare with student feedback.
The course assessments show an overall pattern of relatively weak "application" outcomes compared to "theoretical" outcomes. This is an interesting finding that needs further exploration, to determine what the follow-up needs to be.		
PhD Qualifying Exam	Three students were evaluated and their scores ranged from 4 to 5 on each of the learning outcomes.	Targets still need to be decided, for the percentage of students meeting each learning outcome at the desired level.
PhD Proposal	Averaged over evaluators, student scores ranged from good to excellent on outcomes 1 to 3, from fairly good to excellent on outcome 4, and from adequate to excellent on outcome 5. The "communication" outcome 5 showed some inconsistent scoring between evaluators of the same student. On learning outcomes 1-3 , all 11 students scored '"4" or higher. Learning outcome 5 had one student with a score of "3", averaged over evaluators. There were no students scoring lower than 3.50 on two or more learning outcomes.	The "communication" outcome should be formulated more clearly, e.g., by splitting it up in oral and written communication. Targets still need to be decided, for the average of each learning outcome across students, and for the percentage of students meeting each learning outcome at the desired level. Based on comments provided by evaluators on the scoring forms, a score of 3 (adequate) should often be interpreted as "barely passing". A target for each learning outcome could be a minimum of 80% of students scoring "4" or higher, and all scores higher than 3.0. A target for each student could be no more than one learning outcome with a score lower than 3.50.
PhD Dissertation / Defense	All students scored "good" or better on learning outcomes 3, 4, 5 and 7. Students scored adequate / near good or better on the other five outcomes. Scoring was reasonably consistent between evaluators of the same students for all learning outcomes. Learning outcomes 2 (literature survey) and 8 (question answering) had five out of seven students (72%) scoring "4" or higher, and outcome 9 (publications) only four out of seven (57%). There were no students scoring lower than 3.50 on three or more learning outcomes.	Targets still need to be decided, for the average of each learning outcome across students, and for the percentage of students meeting each learning outcome at the desired level. A target for each learning outcome could be 80% of students scoring "4" or higher, and all scores higher than 3.0. A target for each student could be no more than two learning outcomes with a score lower than 3.50.

g. What INDIRECT EVIDENCE did you use? Indirect evidence includes students' reflections on their own learning in the form of surveys, questionnaires, focus groups, and one-minute essays as well as other evidence, such as admission rates to graduate programs, career placement rates, voluntary gifts from alumni, etc. (Please attach surveys, focus group or essay questions, etc.)

A first analysis of retention of the 23 PhD students starting at CCNY from fall 2008 though fall 2010, shows that 15 of the 23 students (65%) were still retained as of fall 2012, and none had obtained the PhD degree yet. All retained students were in good academic standing (Cum. GPA 3.00 or higher).

Given the relatively high attrition, the recommendation would be to review the advising process with all PhD students to diagnose lack of progress and possible causes of attrition early on. The new (acting) dean of Graduate Studies, Associate Dean Walser, has started reviewing advising and admission processes in the PhD programs with all departments, to determine what needs to be improved.

We plan to perform a similar analysis of retention, study progress and academic standing for the Master's students and collect their input as well.

h. What are your findings from indirect evidence? How do they compare to earlier results?

See the above.

II. Course Learning Outcomes

a. What percentage of full-time faculty members complied with your request to submit syllabi with Course Learning Outcomes (CLOs) in the spring of 2013?

tbd - but (near) full compliance is expected

b. What was the annual (2012-13) percentage of compliance?

tbd - but (near) full compliance is expected

c. Are faculty proficient in composing CLOs? Are they able to align their CLOs with the PLOs? If not, how do you plan to address issues of faculty compliance and competence in this area?

Because of their experience with ABET, all faculty know how to compose CLOs and align CLOs with the PLOs. If the anaysis of learning outcomes on syllabi shows any need for improvement this will be addressed by the director of institutional effectiveness and/or the graduate coordinators. The ME faculty has generally been very open to suggestions and advice on assessment matters.

III. 2012-13 Assessment Plan vs. 2012-13 Assessment Report

a. Have you deviated from the 2012-13 Assessment Plan? If so, how—and why? **No.**

IV. Recommendations and Actions

a. When will you share the 2012-13 assessment report with stakeholders? What opportunities will you or your Chair provide for faculty to discuss the findings?

June 2013 (ASEE Annual Conference), Fall 2013: faculty meetings

b. Are you piloting any new courses or proposing any curricular changes, minor or major, based on your assessment thus far? If so, please describe and fill out the checklist below.

(planned) Use of assessment data for improvement in 2012-2013:	***Check***
a. We made changes in course content	
b. We made changes in course delivery and/or pedagogy	
c. We added and/or deleted courses	*x*
d. We made changes in pre / co-requisites	
e1. We made changes in degree requirements (PhD)	
e2. We made changes in degree requirements (Master's)	
f. We made changes in the emphasis for new / vacant faculty positions	
h. We included assessment results in faculty meetings / retreats, curriculum committee meetings, etc.	*x*
i. We made changes in degree programs and the development of new degree program options	*x*
j. We were able to justify past curriculum changes and show program improvement resulting from those changes	
k. We made changes in the advising processes	*x*
l. We developed academic services for students	
m. We developed new career explorations and/or career services for students	
n. We made changes to student academic facilities such as labs and study areas	
o. We developed / improved academic and program information to students	
p. We shared assessment information with alumni and review/advising boards	
q. We further refined the assessment methods or implemented new assessment methods	*x*
r. We made chamges in instucttional / mentoring emphasis for current faculty	
s. We changed our admissions criteria	
t. ***Other: Dissemination of experiences and findings of Bridges to Engineering project to audience of peers at Annual ASEE conference in Atlanta***	