

The meeting will come to order:

Chair Roberta Brody called the meeting to order at 3:38 p.m.

1. Approval of Agenda:

- i. MOTION: Duly made by Chair Brody and seconded:

“To approve the agenda”

Hearing no objection to the motion the agenda was approved as distributed.

2. Approval of Minutes:

- i. MOTION: Duly made by Chair Brody and seconded:

“To approve the minutes dated March 8, 2012”

Editorial Correction: Amy David –College Wide at Large seat is Open

Hearing no objection to the motion, the minutes were approved as amended.

3. Announcements, Administrative Reports, and Memorials:

1. Senator Liliete Lopez announced the Committee for Disabled Students along with the Student Life, the President’s office and Athletics has invited Jim Abbott the former Yankee pitcher to celebrate Disability Awareness month on April 17, Student Union Ballroom at 5:30pm.
2. Senator Jonathan Heller announced that the watch designed for Queens College’s 75th Anniversary is almost complete. Order forms and brochures will be distributed shortly. For more information see the website: www.qcquartz.com.
3. Alternate Senator Andrew DeMasters announced on behalf of the Center for Teaching and Learning; the online evaluation period will begin on Monday, April 16 through Wednesday, May 16. There will be an evaluation launch party on Wednesday, April 18, during free hour in the Student Union west ballroom; all are invited. For online evaluation see: courses.qc.cuny.edu.
4. Chair Brody announced on the Academic Senate minutes of November 10, 2011, the Graduate Curriculum minutes of October 12, 2011 were omitted, although duly presented and passed by the Senate at the November meeting.
5. Professor Chris Vickery announced they are moving forward with the Pathways Implementation Plan, and guidelines will be coming out tomorrow. Professor Eva Fernandez will have a workshop on April 19, where you can put proposals together.

**4. Special Motion
(None)**

5. Committee Reports

5a. Undergraduate Curriculum Committee

- i. MOTION: Duly made by Senator Kenneth Lord, Chair of the UCC:

“To accept the UCC Minutes dated –March 8, 2012”

Hearing no objection to the motion, Senator Kenneth Lord moved unanimous consent.

A. General Education

- a. Writing-Intensive Sub-committee. No report.
- b. General Education Advisory Committee. No report.
 - i. Perspectives courses. None.
 - ii. Synthesis proposals. None.
 - iii. Global Contexts course proposals. None.
 - iv. Capstone course proposals. None.
 - v. Spirit of PLAS. None.
- c. Pathways. No report.

B. Curriculum Changes

1. Honors in the Humanities (12-02)

- a. Course Description & Program Requirements change:

TO

1. Three foundation courses:

- a. ENGL 165H: an introduction to poetry that provides training in close reading and critical analysis. (RL)
- b. PHIL 104H: an introduction to ethics that emphasizes classical as well as contemporary sources. (CV, ET)
- c. CMLIT 101H: Global Literatures I

An introduction to some of the classic works of ancient and medieval world literatures. (RL, WC, PI)

- b. Course Description & Program Requirements change:

TO:

Courses with Townsend Harris High School

HTH 101, 102. Freshman Humanities Colloquium. 3 hr.; 3 cr. each sem. Prereq.:

Open only to Townsend Harris High School seniors by permission of College Preparatory Programs.

Selected readings from the classic texts of the Western Tradition, from the Bible and the Greeks to Shakespeare (101); from Shakespeare to the present (102). The course will emphasize reading, writing and student discussion. HTH 102 is a continuation of its prerequisite, HTH 101 (prerequisite waived only in exceptional cases by permission of CPP).

For Townsend Harris High School graduates who matriculate at Queens College, HTH 102 fulfills one Reading Literature (RL) course requirement under the PLAS

ACADEMIC SENATE Minutes – April 5, 2012

(5a. UCC minutes continued)

General Education system. Townsend Harris High School graduates at Queens College who pursue the minor in HTH may, in consultation with the HTH Director,

count HTH 101-102 in lieu of either CMLIT 101H or ENGL 165H, towards the HTH course sequence.

2. SEES (12-03)

- a. Course to be put on reserve:

GEOL 100. Introduction to Geology. 3 lec., 3 lab. hr.; 4 cr.

3. URBST (12-04)

- a. Change in title and description.

To Read:

URBST 105. Urban Politics. 3 hr., 3 cr.

Examination of the governance of US cities, especially New York City exploring the historical development of governmental structures, political parties, machine politics and reform movements in US cities. Theories of power in the urban setting and the role of advocacy groups, ethnic organizations, business, labor, and other interest and activist groups will be discussed. (SS, US)

4. URBST (12-05)

- a. Change in title and description.

To Read:

URBST 370. Service Learning Practicum.

1 hr plus 70 hrs. placement, 3 cr. Prereq.: Permission of the department.

Students are placed with community partner agencies and participate in an on-campus seminar that meets at least bi-weekly. The combination of community service and in-class learning builds academic and professional skills and helps students connect their academic studies to their community services experiences.

5. PHIL (12-06)

- a. Change in description.

To read:

PHIL 219. VT: Philosophical Perspectives on the History of Science. 3 hr.; 3 cr. An examination of selected turning points in the history of science and their philosophical significance. May be repeated once for credit provided the topic is different.

- b. Change in description.

To read:

PHIL 260. VT: Readings in Contemporary Ethical Theory.

3 hr.; 3 cr.

An advanced course in ethics involving an intensive study of a limited number of

texts. Emphasis is given to contemporary philosophers, but a continuous effort is made to place these thinkers in the larger context of western philosophy. May be repeated once for credit provided the topic is different.

c. Change in description

To read:

PHIL 261. VT Advanced Problems in the Philosophy of Religion.

3 hr.; 3 cr.

An examination of some of the major problems in contemporary religious thought.

Possible topics include the existence of God; the nature of faith; mysticism; the problem of evil; philosophical aspects of eschatology; the impact of science on religion. May be repeated once for credit provided the topic is different.

d. Change to an existing course: description

To read:

PHIL 262. VT: Recent Continental Philosophy.

3 hr.; 3 cr.

Possible topics include the philosophy of language; the human body; theories of consciousness; Husserl's logical studies. May be repeated once for credit provided the topic is different.

6. Computer Science (12-07)

a. New course.

CSCI 48. Spreadsheet Programming.

2 hr. lec., 2 lab. hr.; 3 cr.

Prereq.: one Math course numbered 110 or higher.

In-depth introduction to spreadsheets as a tool for organizing, processing, and analyzing numerical information in such areas as business, finance, engineering, natural and social sciences. Topics include basic cell operations, text manipulation, formulas, functions, arrays, circular references, charting techniques, pivot tables, conditional formatting, and VBA programming.

b. New course

CSCI 100 Information and Intelligence.

3 hr.; 3 cr; Prereq: none.

How information measurement, encoding, and transmission relate to the design of artificial intelligence agents such as search engines, robots, and programs that mimic human intelligence. Models of human and artificial intelligence; relations among

information, meaning, and data; diagnostic and causal reasoning in the presence of uncertainty. Readings from the literature of information theory and artificial intelligence; writing assignments, completion of a project to design and/or construct an information-driven intelligent agent.

7. Hispanic Languages and Literatures (12-08)

a. New course.

SPAN 051: Hispanic-Jewish Literature in Translation

3 hr., 3 cr.

Introduction to Hispanic-Jewish fiction and critical material (Latin American, Brazilian and Spanish, Sephardic and Ashkenazic). Students will learn to read, discuss and write about texts in fulfillment of the norms of literature as a discipline, including techniques of close reading, stylistic analysis of formal features and literary genres and periods. Students will learn to read novels, short stories, plays and diaries and analyze literary and cultural models that seek to define identity.

5b. Nominating Committee

MOTION: Duly made by Professor Franklin Turner, Chair of the Nominating Committee:

Editorial Correction: change Field to Fields

Add - Graduate Curriculum Committee - Michael Hickerson - M&NS

“To accept the Nominating Committee Report dated April 5, 2012 as amended”

Hearing no objection to the motion, Professor Tuner moved unanimous consent

1. International Student Affairs Committee

The following faculty member was elected by unanimous consent:

Sunghee Shin	At-Large	December, 2013
--------------	----------	----------------

2. Graduate Scholastic Standards Committee

The following faculty member was elected by unanimous consent:

Andrew Rosenberg	M&NS	December, 2013
------------------	------	----------------

3. Campus Affairs, Environment and Graduation Advisory Committee

The following faculty member was elected by unanimous consent:

Anastasiya Lipnevich	Education	December, 2013
----------------------	-----------	----------------

4. **Committee on Honors and Awards**

The following faculty member was elected by unanimous consent:

Carolyn Pytte M&NS April, 2015

5. **Special Committee on Governance**

The following faculty member was elected by unanimous consent:

Dave Fields At-Large April, 2014

6. **Graduate Curriculum Committee**

The following faculty member was elected by unanimous consent:

Michael Hickerson M&NS December, 2013

Graduate Curriculum Committee minutes dated October 12, 2011

1. **Physics (G11-21)**

New Academic Program Letter of Intent

Official program name: **Professional Science Master's in Photonics** or certificate: **s**
Awarded degree **Master' Degree** Sponsoring department **Physics** College name: **Division of Math and Natural Sciences** Awarded degree or certificate: **Professional Science Master's Degree**

Anticipated implementation date: **June 2012**

College governance approval

Date _____ Signature (ChiefAcademicOfficer)

Proposer's chief contact information

Name: LevDeych Title: Professor Telephone number: (718) 997-3380 Fax: (718)997-3349
Email: Lev.Deych@qc.cuny.edu

Table of Contents

PurposeandGoals 3
NeedandJustification 4
StudentInterestandEnrollment 8
Curriculum 10
Articulationandagreements 11
Faculty 11
CostAssessment 13
Evaluation 13
Appendix 15

ACADEMIC SENATE Minutes – April 5, 2012

1. Purpose and Goals

The proposed Professional Science Master's in Photonics (PSMP) degree is aimed at sciencedegree-holding students who seek careers in high-tech industries. These students have a curiosity for science, but their interests are more pragmatic and they are, at least in the interim, not interested in pursuing a career in the Academy. The objective of the PSMP is to provide advanced practical and theoretical training in the field of Photonics and related disciplines combined with developing skills required for immediate employment in Photonics-related high-tech companies at the mid-level technical and manageering positions. The field of Photonics is one of the fastest growing high-tech industries that is expected to generate a large number of jobs. New York companies are actively involved in this field. Such industry leaders as Veeco, Lockheed Martin, Northrop Grumman have Photonics related divisions located on Long Island. The proposed Master's level program in Photonics will allow Queens College to gain leading positions towards preparing students for employment opportunities in these and other similar companies. In contrast to regular Master's and Ph. D. programs in Physics that emphasize fundamental research in an academic environment, the proposed PSMP program will focus on preparing students for conceiving, developing and managing applied projects. Ancillary goals of the PSMP involve:

- 1) new source of revenue generation for the college
- 2) research assistantships for the physics faculty
- 3) outside collaborations with and feedback for training from industry
- 4) long-term networking opportunities and research partnerships among a greater and diversified pool of alumni
- 5) promotion of the physics department's established faculty strength in the area of photonics-related research.

The PSMP purpose and goals outlined above are aligned with the national goals for elevating technical training, promoting emerging technologies and technically-trained staff, retaining those scientifically-trained graduates in the U.S., while reducing the glut of doctoral degrees awarded. There are approximately 60 physics PSMs currently in the country, but only about 20 PSMs that show distinction. Currently, PSMs in physics do not exist within CUNY and only one such program is offered in the greater New York area by NYU. Currently, Queens College undergraduate students majoring in chemistry, earth sciences, mathematics, and computer science, as well as physics, have already shown sincere interest in the proposed PSMP.

ACADEMIC SENATE Minutes – April 5, 2012

2. Need and Justification

There are numerous issues that create demand for a PSM and physics training beyond the Bachelor's degree short of a Ph.D. The PSMP addresses short-comings of the current doctoral programs, addresses national trends and concerns for technical training, improves research infrastructure by bridging academic and industrial stakeholders.

Currently the most common form of post-Bachelor's scientific training is a Ph.D. degree, which typically takes 5 to 7 years and is aimed at those interested in pursuing an academic career. Subsequently, the Ph.D. degree demands rigorous research focus and endows students with skills relevant for success in academic world. The academic emphasis is placed on participation in research programs whose main goal is publishing research papers and writing grant proposals. There has been growing concern among many in academia and government that the number of doctoral students produced exceed available professorial

^{1,2} openings, while those who would like to enter the workforce sooner are discouraged from pursuing their education beyond Bachelor's degrees. Generally for these sole-undergraduate degree holders, only entry-level positions are available. Therefore, the PSMP degree is appealing to students for several reasons: 1) within a short 1-2 year training program, graduates may enter the workforce above entry-level positions; 2) for those who have science training in a field other than physics, there is an opportunity to augment skills and join high-tech industry; 3) the PSM focuses on developing a broader professional skills appropriate for mid-level management positions.

Meanwhile, the American Institute of Physics has recently completed studies funded by the Sloan ³ Foundation on PSMs programs. This article provides statistics that promote the unique role that such programs might have for stimulating the economy and building new industrial partnerships. Among the reported statistics are the high proportions of Master's Students that find careers in teaching or industry, and also that remain in the U.S. after achieving the degree. The study also lists important elements of a PSM degree that deserves distinction.

Terminal Master's programs across the country and at Queens College already exist. In most cases, the curricula of the current Master's of Physics degrees do not have any clear purpose and, therefore, do not attract many students. The majority of the Physics Master's degrees in the U.S. are awarded to students failing to obtain their Ph.D. degrees or to high school teachers who earn a Master's Degree in order to fulfill certification requirements. It is worthwhile to note that the

¹ Taylor, Mark "Reform the PhD system or close it down" *Nature* 472, 261 (2011).

² McCook, Alison "Education: Rethinking PhDs" *Nature* 472, 280-282 (2011).

³

MasteringPhysics for Non-Academic Careers by Stephen D. Norton, Philip W. Hammer, and Roman Czujko. Supported by the Alfred P. Sloan Foundation, this study analyses of all the master's programs in physics departments in the U.S. latter category of students is also not appropriately served by the current Master's Programs either, because their curricula demand intricate physics knowledge beyond what future high-school teachers typically want or need to know.

AIP reports that there are approximately 60 PSMs in the country, with 20 programs having been initiated too recently to be evaluated. At this time there are approximately 20 PSM programs that meet the AIP list of distinction. Such programs meet following list of criteria established by AIP:

“Professional Master's Degree programs have some combination of features that fall into four general categories:

- *bridge building*
- *programmatic emphasis*
- *research experiences*

• non-technical aspects Bridge building between the physics department and the world outside of academe encompasses two essential goals: first, to develop formal mechanisms for identifying the needs and opportunities in the market place and, second, to provide a feedback mechanism to ensure that the program is able to respond to the inevitable changes in demand over time.

The programmatic emphasis can focus on the expertise of the faculty within the physics department or it can be cross-disciplinary combining the expertise within the physics department with that of one or more other departments at the same university.

The students and faculty in the program may have formal research experiences that are based on a collaboration with a corporation or government laboratory, involve internships or other off-campus work experiences, or provide hands-on research experiences within the physics department.

ACADEMIC SENATE Minutes – April 5, 2012

Finally, non-technical aspects of the program are those that address the unique needs of potential students through evening classes, day classes or some combination of the two. They also include structured activities that provide students with expertise in non-technical areas that are essential to success in today's work place, notably communication skills both oral and in written form as well as interpersonal and team work skills”.

The PSMP proposed by Physics Department of Queens College will have all the elements described above such as bridge-building, research/industrial internship opportunities and nontechnical aspects with programmatic emphasis in the areas of strength of current physics faculty in cooperation with faculty members from the department of economics.

We will employ greater hands-on laboratory experience relevant for modern technologies, provide on-job training through internships, incorporate elements of business education and will provide special training in the areas of oral and written communication skills. These parts of the program are developed without sacrificing the rigor of the fundamental physics curriculum. The suggested program is designed with two goals in mind: to endow students with marketable technical and business skills while providing them with a solid understanding of modern physics, strong analytical and problem-solving skills. Bridge programming will be satisfied by industrial collaborations.

Courses offered within this program may be broadcast online via Tegrity, a program that uses a webcam to allow browser access to video lectures and their podcasts. The online access to prerecorded lectures will allow enrollment of part-time employees and additional revenue stream for the college. Queens College already has significant investment in Tegrity, so the additional expense for the PSMP is negligible. A significant number of courses may be scheduled in the evening in order to accommodate part-time working students.

Industrial connections and internships will be developed through Industrial Advisory board, whose members will provide students with internship opportunities and a feedback to adapt the curriculum for needs of businesses. It is highly anticipated that in addition to providing research internships and enriching the programmatic focus for PSM students, the industrial connections will strengthen the research network for faculty at Queens College.

The specific program being developed at Queens College builds on the research and educational strength of QC Physics Department. The core of the department's research activity encompasses the area of Optics and Photonics, where numerous members of the faculty enjoy national and international renown. Subsequently, the program proposed here aims at preparing students for companies that develop optical instruments, lasers and LEDs, integrated photonic devices, photovoltaics and solar cells, and other similar products or providing services in these areas.

Graduates of this program can be employed in a variety of capacities in companies working in the fields specified above. Among possible job titles are the following: “Test and Instrumentation Engineer,” “Device Design Engineer”, “Process Development Engineer”, “Quality/Reliability Manager”, “Laser Engineer”, “Business Development Manager”. The average salary in this field is listed as about \$80,000 (source: Global Markets: Photonics salary survey, <http://www.photonics.com/Article.aspx?AID=36251>) The samples of the job postings are given below (from <http://photonicsjobs.com> and Photonic Group of LinkedIn <http://www.linkedin.com/>)

ACADEMIC SENATE Minutes – April 5, 2012

1. Business Development Manager - Optics, Optoelectro

Posted by: Manny Rao

Posted date: 2011-May-09

Location: Syracuse, NY

Manufacturer of custom engineered devices in optics and optical electronics is looking for an experienced Business Development Manager to join the Executive Management team of a privately held company in Upstate NY.

The company sells to OEMs on a national basis. They create custom solutions only. They have no "off the shelf" products. The BDM will call on companies and try to create a project or solution for their products. The sales cycle could take 2-3 years and the project itself could take 7-10 years. They sell to the medical, machine vision and document scanning markets. Person must have min 5-7 years of technical solution sales experience to the OEM market. They are not looking for someone that has sold "products" alone.

Technical degree is highly preferred, electrical, measurement or physics. Person must be aggressive and self motivated and want to be a key leader in the growth of the company. Reports to the COO who is a PhD, who reports to the owner in Switzerland.

2 Device Scientist at Soraa, Inc.

Location: Fremont, CA

The Company: Soraa is a rapidly expanding clean-tech company commercializing disruptive, energy saving solutions. Leveraging fundamental semiconductor materials advances, Soraa was founded in 2008 by world renowned semiconductor pioneers Professors Shuji Nakamura, Steven Denbaars and James Speck of University of California, Santa Barbara. Soraa is funded by Khosla Ventures and has established a vertically integrated fabrication facility with operations in California's Silicon Valley and Santa Barbara. To learn more about Soraa, visit www.soraa.com.

Description: We are seeking a device scientist to join our team and develop state-of-the-art high power GaN based laser diodes from concept to product. This person would reside in the Laser Device group, but work closely with the Epi group and High Power Product group.

Responsibilities Include:

- *Drive efforts to fabricate, test, and optimize new laser concepts until production release*
- *Develop and implement simulation and design tools to aide laser development and understanding*
- *•Responsible for design of high power chips from concept, through optimization, and to production*
- *Design, simulate, and define processes for new high power GaN-based laser diodes*
- *Propose novel concepts for next generation products*
- *Write reports and proposals*
- *•Lead R&D development projects*
- *Qualifications:*
- *3+ years of hands-on industrial experience related to III-V semiconductor devices with strong emphasis on design and fabrication of edge-emitting laser diodes; high power preferred*
- *Strong experience in simulation, fabrication, test and reliability of diode lasers*
- *Strong experience in semiconductor processing. GaN experience is preferred*
- *Excellent understanding of epitaxial design and material quality implications to device performance*
- *Self-motivated, hard-working, and strong team player*
- *Advanced degree in Physics or Engineering preferred*

ACADEMIC SENATE Minutes – April 5, 2012

Letters of support from our Industrial Advisory Board are included in the Appendix.

3. Student Interest and Enrollment

Similar programs already in place across the country have been identified. According to AIP's recent study, the best PSMs in Physics in the country are:

- Appalachian State University
- Ball State University
- California State University, Long Beach
- Christopher Newport University
- Columbia University
- East Carolina University
- Georgia Institute of Technology
- Idaho State University
- Illinois Institute of Technology
- Northern Illinois University
- Rose-Hulman Institute of Technology
- San Jose State University
- Texas Tech. University
- University of Central Oklahoma
- University of Massachusetts, Lowell
- University of Oregon
- University of Rochester
- University of Texas, Austin
- University of Utah
- University of Vermont
- University of Washington
- Virginia Polytechnical Institute

ACADEMIC SENATE Minutes – April 5, 2012

The majority of the schools with PSMs in physics are, like Queens College, public institutions that also conduct a fair degree of research.

CUNY's Office of the Vice Chancellor for Research has recently published results with data collected via an online survey from undergraduate students at five senior colleges⁴. More than a thousand students were surveyed and approximately half indicated that the highest degree that they plan to pursue is a Master's degree. A PSM in applied science was considered, from the survey, one of the most popular PSM programs sought. The report concluded that CUNY students demonstrate interest and are particularly receptive to an affordable applied science PSM that provides work-oriented training beyond a Bachelor's degree.

An initial incoming class of 6-8 is expected in year 1. After the end of the fifth year, the program should have more than 30 students with 5-6 graduates per year. Moreover, a paid job internship and job placement rates of 90% or higher is anticipated. These projections are based on the performance of

the PSMs listed in the American Institute of Physics report⁵ with similarly sized physics departments, a similarly-oriented research faculty, and with metropolitan access to local industries, namely, California State Long Beach and Cleveland State University. In the future, when the program matures, it is expected that it will enroll about 15 – 20 students annually, which is a modest estimate compared to national average of 45 students annual enrollment in graduate programs according to Forward Analytics projections based on trend data from American Institute of Physics.

The selection process for the PSMP enrollment will be determined by the student portfolio involving grade point average, courses, recommendations, a personal statement, and work

⁴ "CUNY PSM Student Survey Summary" CUNY Office of the Vice Chancellor for Research, released by Derek Steele, August, 2011

⁵ "Programs that Match Every Interest - Master's Degrees in Physics" by Roman Czujko & Megan Henly. April 2005. and research experience; the GRE will not be a requirement for entrance to the proposed PSMP. Since industry recognizes that professionals leverage panoply of interpersonal and management skills in order to succeed in the workplace, a personal statement that indicates maturity and reliability may be weighed more heavily than grade point average. Advising will be provided alongside recruitment for the program, not only to ensure appropriate expectations for training, but also to gauge interest and incoming skill level. The Spring Physics Department Open House, informal interviews, and advising will solicit and inform potential enrollees about the PSMP at Queens College.

4. Curriculum

The curriculum of the PMP consists of four key areas: core physics courses, core technological courses, a business course, and internships. The intellectual rationale for the curriculum is a dual emphasis on principal fundamental knowledge and ancillary specialized skills. It is over fundamental knowledge that graduates will build a long-term career, and with specialized skills that they will achieve competitive career placement after earning the degree. The detailed description of the courses follows.

1. Classical Mechanics (1 semester, 4 credits) (Lagrangian and Hamiltonian formalisms, principle of least action, phase space, Liouville theorem, Boltzmann equation)
2. Classical Electrodynamics (1 semester, 4 credits) (macroscopic Maxwell equations, theory of multipoles, electrostatic properties of conducting and dielectric spheres and ellipsoids, plasmonic resonance, magnetostatics and magnetic polarization, capacitance, inductance and electrodynamic theory of ac circuits, electromagnetic waves, radiation, antennas and antenna arrays)
3. Optics and Optical Instruments (1 semester, 4 credits) (3 hours lecture + 2 hours lab) (Geometric optics; periodic and non-periodic waves; Doppler effect; interference and diffraction, diffraction gratings; photonic crystals, spectrographs, monochromators and interferometers; polarization of light; fiber optics; introduction to lasers, optical imaging, optical gyroscopes, electro-optics)
4. Quantum Mechanics (1 semester, 4 credits) (Basic formalism of Quantum Mechanics, one-dimensional problems: quantum wells and barriers with applications to semiconductor heterostructures, Kronig-Penney model; angular momentum and spin, undistinguishable particles, hydrogen-atom, light-atom interaction)
5. Computational Physics (1 semester, 4 credits) (2 hours lecture, 2 recitations) (Application of MatLab platform for simulation of selected problems in optics, electromagnetism and quantum mechanics; COMSOL package for electrodynamic simulations, modeling and design)
6. Experimental Physics: testing, measurement and analysis (1 semester, 4 credits: 6 hours lab) (Computer-instrument interfacing, using (NU) LabView environment, fitting, elements of error analysis)
7. Semiconductors: Optical properties and devices (1 semester, 6 credits) (4 hours lecture + 3 hours lab) (Direct and indirect semiconductors, doping, alloys, absorption, luminescence (photo-, cathode-, electro-),

ACADEMIC SENATE Minutes – April 5, 2012

excitonic versus impurity luminescence, dependence on temperature and pressure; P-N diodes, solar cell technologies, transistors, LED, laser diodes)

8. Foundations of growth techniques (1 semester, 4 credits) (The course will cover colloidal synthesis, CVD, and PECVD; lectures will be accompanied by demonstrations using research labs of QC physics faculty).

9. Basics of Microfabrication (1 semester, 4 credits) (The class will cover discussion of mask design, lithography, metallization, dry and wet etching)

10. A course on technical writing and speaking (1 semester, 3 credits) (In this course students will prepare written reports and oral presentations on various technical topics relevant to their program of studies)

11. A course on business and economics of high-tech industry (1 semester, 3 credits) (This course will discuss management structure, product development, technology commercialization, liability issues, and other topics dealing with management and economics of high-tech businesses)

12. Final project – a team (3 students in a team) project to be completed during the 2nd year of the program. The project should include design, modeling and fabrication of a particular product approved by the project supervisor

13. Three months of summer internship at the end of the 1st year of the program (2 credits).

Total: 44 credits + final project

5. Articulation and agreements

No articulation agreements are necessary; the letters of support from industry partners are found in the appendix.

6. Faculty and equipment

A. Participating faculty

Courses required for this program will be taught by following faculty members, who can also advise and provide research opportunities to students.

- Lev Deych, Professor. Expertise: electro-optical properties of multiple-quantum wells and microcavities with the objective of designing structures suitable for switching and modulating applications.
- Aziel Z. Genack, Distinguished Professor. Expertise: study of classical and experimental microwave propagation in the presence of disorder; interference of backscattered waves.
- Alexander A. Lisiansky, Professor. Expertise: polariton optics of quantum heterostructures, localization properties of one-dimensional systems, and wave propagation in random materials.
- Igor L. Kuskovsky, Associate Professor. Expertise: quantum dots, nanocrystals, nanowires, and nanorods as the building blocks of nano-photonics devices with potential application in photo-detection, quantum information, and biomedical field.
- Vinod M. Menon, Associate Professor. Expertise: next generation photonic devices and materials that achieve light confinement at the micro and nanoscale, and artificially engineered materials with new optical properties.
- Lev G. Murokh, Assistant Professor. Expertise: Biologically-inspired applications of quantum theory in nanostructures

ACADEMIC SENATE Minutes – April 5, 2012

Steven A. Schwarz, Professor. Expertise: Luat T. Vuong, Assistant Professor. Expertise: nanocomposite pattern formation and self-assembly dynamics for next-generation solar cells and organic electronics. Curriculum Vitae are available upon request.

In the first years of the program, when the enrollment is expected to be at the level of the current MA Program in Physics, most of the courses required for PMP will be also made available to undergraduate students, and will not, therefore, draw faculty from their existing teaching obligations. An economics course will be offered in cooperation with economics department (Dr. Diane Coogan-Pushner is the contact person) and will require hiring an adjunct. However, this course will be made available to all undergraduate students in the Division of Math and Sciences as an elective, and is expected to attract significant interest. Respectively, enrollment in this course is expected to be sufficiently high so that the college will not incur any additional costs associated with it.

The course on scientific writing and speaking will be offered as an intercampus course (via teleconferencing) and will be taught by Professor Steve Schwartz, who has been successfully teaching a similar course at the undergraduate level for the last 5 years. The new courses on growth processes and microfabrication techniques will be taught by current full-time faculty. At the same time, it is anticipated that these courses can be of interest to Master students at CCNY and Brooklyn College, so that they can also evolve into intercampus courses.

In the future, when the program matures the Department will require hiring one or two full time faculty to maintain the program. Provided that the PMP grows as anticipated, one full-time administrative assistant will be needed. The costs associated with additional hires will be offset by the tuition and student fee revenues.

B. FACILITIES AND EQUIPMENT

It is desirable to have a common office or lounge that is designated for Master's students. Such a room would build cohesion and encourage networking or team-building opportunities among full-time and part-time students. The space should ideally accommodate 10 students with WiFi and associated desk space; the majority of the part-time students will not study on campus. The Department has sufficient computer and software resources to run all courses necessary for the program.

C. LIBRARY AND INSTRUCTIONAL MATERIALS

No new library or instructional materials will be necessary, however the campus license with Adobe Connect or Tegrity, for the purposes of accommodating part-time students, may increase enrollment.

7. Cost Assessment

In the first years of the program, the costs of its running are expected to be minimal. It will mainly include expenses for advertising and for one adjunct teaching an economics course. In the future (5-6 years into the program), one or two new full-time assistant professors and one administrative assistant will be required.

The assessed costs are expected to be offset by expected revenue. In addition to tuition, other potential sources of income include: matching funds from industrial research projects that interns undertake, increased external grants enabled by Master's student researchers, and private donations by professional alumni.

It is anticipated that even with an annual budget of \$10k/year and enrollment of 6 students per year the proposed PSMP will generate net profit within the first two years of operation.

8. Evaluation

The success of the program will be evaluated by several factors, but most importantly, by job placement of its graduates in high-tech applied physics and photonics industries. It is essential that the PSMP achieves a strong reputation for superior career preparation not only among student peers but with industrial liaisons on the advisory board. Finally, as the skills required for industry change and often demand varies rapidly in cycles of just a few years, immediate feedback is necessary. The ability of the program to adapt to the industrial environment must be built into the evaluation process in order for the program to be successful long-term. For this reason, the following procedures will be used to evaluate the PSMP:

- Annual meetings will be scheduled with industrial partners with the specific aim of providing curriculum evaluation and feedback about internships. The meeting will be composed of at least two faculty, who will be responsible for adapting the course syllabi annually.



Terminal Drive • Plainview, NY 11803 • Phone: (516) 349-8300 • Fax: (516) 349-8321 •

www.veeco.com

September 7, 2011

Lev I. Deych, PhD Professor, Department of Physics Queens College of CUNY 65-36 Kissena Blvd.
Flushing, NY 11367

Dear Dr. Deych:

Our company supports development of the Professional Science Master Program in Optics by the Physics Department of Queens College of CUNY. We believe that such a program will provide students with the set of valuable skills that would significantly improve their chances in finding employment in the optics related industry. We are ready to participate in developing and functioning of this program via the Industrial Advisory Board and by providing potential internship opportunities when possible.

Sincerely,

Adrian Devasahayam PhD Sr. Director, Technology

2. Aaron Copland School of Music (G11-22)

Change in course description:

To Read:

MUSIC 776. Chamber Music III . 1 hr.; 1 cr. Fall, Spring. May be repeated for credit once.

MUSIC 774–776 is a required three-course sequence for M.A. students in classical performance, totaling 3 credits (1 credit per semester). Most students in classical performance take four semesters to complete the degree. We believe that students in this program should study and perform chamber music in each semester of residence. Therefore, although a fourth semester of chamber music will not be required, we would like fourth-semester students to be able to take chamber music for credit. The proposed limit of one for-credit repetition is intended to discourage students from taking longer than four semesters to complete the degree.

As the attached syllabus indicates, graduate chamber music, MUSIC 774–776, is offered in mixed sections with undergraduate chamber music, MUSIC 255. MUSIC 255 is repeatable for credit without limit (2007–2009 Undergraduate Bulletin, p. 210).

3. Elementary & Early Childhood Education (G11-23)

Changes in Requirements for the Graduate Bulletin

Elementary & Early Childhood Education

On page 82 of the 2009-2012 Graduate Bulletin, add in the following section immediately

preceding the Faculty listing:

Departmental standards for all programs:

Responsible training for work in the areas of elementary and early childhood education requires that candidates, in addition to meeting their program's academic requirements, also demonstrate appropriate professional behavior in all classroom, field, and professional settings. Such behavior includes, but is not

limited to, interpersonal skills, professional judgment, ethical conduct, and academic integrity. In addition, candidates are expected to demonstrate oral and written communication proficiency, sensitivity to student issues, including those related to diverse backgrounds, practices, and beliefs, as well as the effective management of personal stress or adjustment difficulties. Candidates who fail to meet these personal and professional standards will be subject to review by their program faculty and/or the EECE Student Review Committee, and sanctions, such as dismissal from the program, may result. Students have the right to appeal, and should familiarize themselves with guidelines set forth in this Bulletin.

6. Old Business (none)

7. New Business

7a. University Faculty Senate Elections

MOTION: Duly made by Chair Brody and seconded:

“To elect the following faculty members to the University Faculty Senate”

Dean Savage
Jack Zevin
Anthony Gonzales

Hearing no objection to the motion, Chair Brody moved unanimous consent.

MOTION: Duly made by Parliamentarian Dave Fields seconded and passed:

“To Adjourn”

The meeting was adjourned at 4:56 pm. The next Special Academic Senate meeting is on Thursday, May 3, 2012.