MEMORANDUM

To: Professor Willie Faye Garrett
   Chair, ASPPC, Faculty Senate

Thru: Dr. Hailemichael Seyoum, Coordinator
       Physics Program

From: Dr. Daryao Khatri, Professor and chair
       Departmental Curriculum Committee

Date: April 30, 2012

Subject: Physics Program Review Recommendations

Based on extensive discussions among faculty, chairs, a number of university officials, and the recommendation of the College of Arts and Sciences (CAS) College Curriculum Committee (CCC), the recommendation and its rationale are provided as follows:

Recommendation

The Physics Program continues to offer the Bachelor of Science (B.S.) degree under the College of Arts and Sciences.

Rationale for the Recommendation

1. The physics program provides a variety of service courses to Biology, Chemistry, Computer Science, Engineering, mathematics, and Technology majors.

2. The graduate school in physics is practically free. Almost everyone pursuing an advanced degree in physics receives assistantships and scholarship for tuition and living expenses. The expenses are covered by grant funds.

3. African Americans are severely underrepresented in physics. Although African Americans comprise approximately 12.4% of the U.S. population, they only earned 9% of all the bachelor's degree awarded in 2008, but only 2.9% in physics. When it comes to receiving Ph.D.'s in physics, only one percent of all Ph.D. degrees in physics are awarded to African Americans. (Source: American Institute of Physics, October 2010)
4. “Two thirds of today’s high school physics teachers did not major in physics”. “Over 90% of middle school physical science students are taught by teachers without a physical science major or certification. The American Association for Employment in Education consistently lists high school physics as one of the fields with the most severe teacher shortages.” (Source: http://physlr.org/2010/07/27/the-shortage-of-physics-teachers/)

5. An amazing statistics: Although UDC accounts for 0.1 percent of the total number of institutions awarding degrees in physics, UDC’s graduates receiving Ph.D. degrees in physics account for approximately 10% of all Ph.D.s earned by African Americans; a factor of 100 in favor of UDC. There are 767 institutions of higher education in the United States, including 35 HBCUs, that awards physics degrees. Over a period of 30 years, African Americans received 291 physics PhDs; almost 10 a year. UDC has contributed about one student per year who have earned a physics PhD during the same period (Source: American Institute of Physics, September 2008).

6. A major in physics nurtures strong analytical and experimental skills as well as mathematical abilities such as mathematical modeling. There are at least six categories of jobs that are available to physics majors: (1) physics positions, (2) Physics computer science positions, (3) physics/astronomy positions, (4) physics/biology positions, (5) physics/geology positions, and (6) other related positions. Among these six categories, there are at least a total of 44 positions that are available to physics majors (http://valenciacollege.edu/careercenter/documents/physics1.pdf). The private industry employs almost 45% PhD physicists. (Source: http://www.physics.purdue.edu/career/images/largest_emp.jpg)

7. In Maryland alone, there are at least 30 private and federal organizations that have hired at least three physics majors each during the 2006-2007 years. Some of them are: Defense Technologies, Inc., Honeywell, Naval Air Systems Command, Space Telescope Science Institute, ViaSat, Inc, etc. (source: http://www.aip.org/statistics/trends/states/state.html)

8. The unemployment rate of physics majors varies from 0 to 4.5% depending on the specialization and the degree earned. The unemployment rate for astronomy and astrophysics is zero percent; the unemployment rate for a Ph.D. in physics has been around 1% for non-residents; and it has been stated as high as 4.5% for B.S. physics majors. (Source: http://graphicsweb.wsj.com/documents/NILF1111/#term=). We are not aware of any UDC’s physics major who has ever been unemployed.

9. As a physics major, you won’t spend much time worrying about how to pay off those student loans. You’ll be pleased to discover that physicists actually boast among the highest average annual salaries according to the U.S. Bureau of Labor Statistics in 2006: $99,900 for all physicists and $112,700 for government employees with a Ph.D. (Source: http://www.andrews.edu/cas/physics/about/career.html)

10. The FTE for the physics program compares favorably with other science departments (e.g., the FTE for physics is 9.1, almost the same as for other science departments)

11. The physics program has created a niche in the research area of Magnetics and Magnetic Materials headed by Dr. Seyoum.

12. The department program is an emerging leader in pedagogy, retention, and students’ recruitment for STEM Majors. The department has achieved a retention rates of close to 100% in a number of college physics and organic chemistry I courses. In addition, the physics department and
the university have the potential of becoming a leader in the area of eliminating the need of remedial math and English courses through the Gateway Academic Program (GAP). Moreover, it has successfully tested strategies for recruiting and retaining physics majors. (sources: technical reports and AAPT)

13. The recommendation does not incur any additional costs. The labs and offices are already located in building 44 in CAS. (Sources: internal memos)

Thank you very much.