**TOPIC**: University of Maryland, College Park: Proposal for Undergraduate Differential Pricing for FY 2016

**COMMITTEE**: Committee of the Whole

**DATE OF COMMITTEE MEETING**: May 6, 2015

**SUMMARY**: The University of Maryland, College Park (UMCP) is proposing market-based, differential pricing limited to three majors of study—Business, Engineering, and Computer Science. These majors meet five restrictive criteria: (1) high cost of instruction; (2) high demand by students; (3) high national standing; (4) high placement rate and salary upon graduation; and (5) high economic impact on the State. The detailed proposal with financial justifications, enrollment data and proposed rate structure is attached.

In the current rate structure of a "one-tuition-fits-all" approach, the higher cost to educate students in some majors is spread among all students. As such, the University has reallocated funds from lower cost to higher cost programs. This partial cross-subsidization is constrained by the need to preserve academic quality in lower cost programs.

The majority of the public AAU member universities and all Big Ten flagships—with the exception UMCP—utilize differential pricing. The median differential tuition for these majors at Big Ten peers is $1,400 per year for four years, a total of $5,600. UMCP's proposal is benchmarked to the Big Ten median. However, the differential pricing would apply only to juniors and seniors in these majors, affecting about 20% of undergraduates and it will be phased-in.

UMCP proposes that junior and senior level business, engineering and computer science students will pay the annual standard tuition and mandatory fees *plus* the differential pricing. Resident and non-resident students will pay the same differential pricing. In FY 2016, the differential pricing will be $700/year. Starting in FY 2018, the full differential will be in effect at $2,800/year.

The new revenue from the differential rate, $16 million annually once fully implemented, will serve to enrich the education, attract more top in-state students, spur innovation and economic growth in Maryland, and strengthen the excellence and national standing of Maryland's flagship university.

This gross revenue will be invested as follows:

- Financial aid: 25% will be reserved for grants for all very-low and low-income students as well as full scholarship students, thereby exempting them from the differential.
- Academic excellence: 65% will go to enhance educational quality and national competitiveness (smaller classes; more faculty, advisers, career services, and internships; upgraded learning technology, lab instrumentation, etc.).
- Access to the major: 10% will support enrollment increases in Engineering and Computer Science and the creation of two new Business minors for students.

The University is also seeking an exception to Board of Regents Policy on Tuition-VIII 2.01. According to Section II.B of the policy,

> *"Tuition for each category of student at an institution will be established either as an annual cost or specified as a cost per credit hour. The tuition levels should be established in accordance with the following principles:*
>
> 1. *Generally, undergraduate tuition within an institution should not vary by discipline or cohort, except for the professional schools at the University of Maryland, Baltimore. However, institutions may seek an exception to this policy."*

**ALTERNATIVE(S)**: The Board may elect to adjust the recommended tuition schedule.

**FISCAL IMPACT**: The projected gross revenue from the proposed differential pricing during the phase-in years of FY 2016 is $4 million/year and FY 2017 is $8 million/year. By FY 2018, after full implementation, the increase in gross revenue is estimated to be $16 million/year.

**CHANCELLOR'S RECOMMENDATION**: That the Board of Regents approve for the University of Maryland, College Park the proposed Undergraduate Differential Pricing for FY 2016 as set forth in the attachment; and, authorize an exception to the Board of Regents Policy on Tuition-VIII 2.01 as permitted in Section II.B.1 of the policy.

COMMITTEE RECOMMENDATION: DATE:

BOARD ACTION: DATE:

SUBMITTED BY: Joseph F. Vivona (301) 445-1923

"*NOTE: Notwithstanding any other provision of this or any other University System of Maryland publication, the University System of Maryland reserves the right to make changes in tuition, fees, and other charges at any time such changes are deemed necessary by the University System of Maryland institutions and the University System of Maryland Board of Regents.*"

**UNIVERSITY OF MARYLAND, COLLEGE PARK**
**FY 2016 Proposed Undergraduate Differential Pricing Rates for**
**Business, Engineering and Computer Science Majors**

Differential pricing applies only to junior and senior level students in these three majors.
These students will be charged the annual standard tuition and mandatory fees *plus* the annual differential pricing rate.
In-State and Out-of-State students will be charged the same differential pricing rate.

| | | | Proposed Change | |
|---|---|---|---|---|
| | FY 2015 | FY 2016 | Amount | % |
| **DIFFERENTIAL PRICING RATES** | | | | |
| Full-Time Undergraduate Jr./Sr. Rate | $0 | $700 | $700 | N/A |
| Part-Time Undergraduate Jr./Sr. Rate (per credit hour) | 0 | 29 | 29 | N/A |

| | | | Proposed Change | |
|---|---|---|---|---|
| | FY 2015 | FY 2016 | Amount | % |
| **FULL-TIME UNDERGRADUATE STUDENT** | | | | |
| In-State Tuition | $7,764 | $8,152 | $388 | 5.0% |
| Out-of-State Tuition | 27,905 | 29,300 | 1,395 | 5.0% |
| Differential Pricing Rate (Jr./Sr.) | 0 | 700 | 700 | N/A |
| Mandatory Fees (per student) | 1,815 | 1,844 | 29 | 1.6% |
| **Total In-State Full-Time** | **9,579** | **10,696** | **1,117** | **11.7%** |
| **Total Out-of-State Full-Time** | **29,720** | **31,844** | **2,124** | **7.1%** |
| | | | | |
| **PART-TIME UNDERGRADUATE*** | | | | |
| In-State Tuition | 324 | 340 | 16 | 4.9% |
| Out-of-State Tuition | 1,163 | 1,221 | 58 | 5.0% |
| Differential Pricing Rate (Jr./Sr.) | 0 | 29 | 29 | N/A |
| **Total In-State Part-Time Tuition** | **324** | **369** | **45** | **13.9%** |
| **Total Out-of-State Part-Time Tuition** | **1,163** | **1,250** | **87** | **7.5%** |
| | | | | |
| Part-Time Mandatory Fees (flat rate per student) | 840 | 855 | 15 | 1.8% |

*all part-time rates are per credit hour unless noted

# Excellence, Growth & Access

ENCHANCING BUSINESS, ENGINEERING & COMPUTER SCIENCE UNDERGRADUATE DEGREES

UNIVERSITY OF MARYLAND

The demand and cost-of-instruction for business, engineering and computer science majors is soaring. Attracting the best students and faculty is challenged by the University's current "one-tuition-fits-all model."

**HIGH COST OF INSTRUCTION**

The cost of instruction is, on average, **25% HIGHER** in Business and Engineering majors.

**ENORMOUS DEMAND FOR DEGREES**
2008 VS. 2014

2759 vs. 4024
**Engineering**
+46%

894 vs. 2167
**Computer Science**
+142%

**Business**
*No change, restricted enrollment limit in place*

**CURRENT STUDENT-TO-FACULTY RATIO**

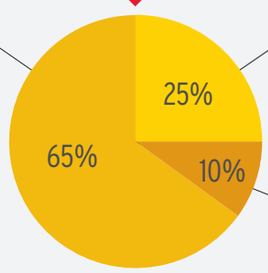
UMD AVERAGE 18:1

| 29:1 | 21:1 | 93:1 |
|---|---|---|
| **Business** | **Engineering** as high as 31:1 in some departments | **Computer Science** |

**UMD IS THE ONLY INSTITUTION IN THE BIG TEN CONFERENCE WITHOUT DIFFERENTIAL PRICING.**

Differential pricing will enrich the educational experience, reduce class size, enhance the value of degrees, attract more top in-state students, and strengthen the excellence and national standing of the State's flagship university. **UMD proposes differential pricing, for juniors and seniors only, in select majors**: Business, Engineering and Computer Science. Differential pricing will begin with a gradual increase in FY15 with full implementation by FY19. (SEE CHART BELOW)

## 3 AREAS OF IMPACT




### 1) DRIVE EXCELLENCE

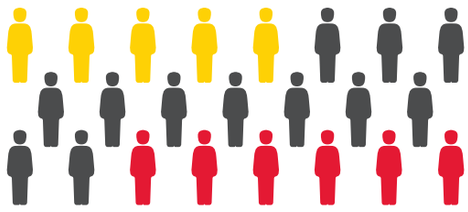
**IMPROVE STUDENT-TO-FACULTY RATIO**

| 27:1 | 20:1 | 74:1 |
|---|---|---|
| **Business** | **Engineering** | **Computer Science** |
| +7% improvement | +4% improvement | +21% improvement |

**ACADEMIC INVESTMENT**

- Hire more academic advisors, teaching lab technicians, and career services/placement personnel.
- Increase student opportunities for supervised research and internships.
- Improve instructional infrastructure: upgrade lab instrumentation, computing facilities, and learning technologies; create more incubator spaces for student start-ups.

23
**NEW FACULTY MEMBERS**



**Business** / **Engineering** / **Computer Science**

### 2) EXPAND AID, EXPAND ACCESS

**$4 million**
in new financial aid.

**Pell-eligible** low income students will see **no net increase** to their cost of education.

### 3) GROW ENROLLMENT

**+720**
**Business Minors**

**2 New Business Minors**
in General Business and Innovation & Entrepreneurship

**+40**
**Engineering Majors**

**+20**
**Computer Science Majors**

**New State-of-the-Art Instructional and Research Facilities:**
A. James Clark Hall and Brendan Iribe Center for Computer Science and Innovation

## PHASING IN DIFFERENTIAL PRICING

**UMD's phased-in approach minimizes the impact on current students and is implemented only on Junior and Senior level courses.**

| FISCAL YEAR | STUDENT STATUS | FINANCIAL IMPACT | PERCENT INCREASE* |
|---|---|---|---|
| FY15 | Current Seniors | No increase | |
| FY16 | Current Juniors | $700 increase in Senior year | + 2% |
| FY16–17 | Current Sophomores | $700 increase in Junior year, $1400 increase in Senior year | + 6% |
| FY17–18 | Current Freshmen | $1400 increase in Junior year, $2800 increase in Senior year | + 11% |
| FY19 AND BEYOND | Future students | $2800 increase in Junior year, $2800 increase in Senior year | + 15% |

**based on $38,000 in-state, 4-year tuition plus differential pricing.*

UNIVERSITY OF MARYLAND

OFFICE OF THE PRESIDENT

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May 1, 2015

**Proposal for Affordable Flagship Excellence, Access, and State Economic Growth: Differential Pricing of Degrees in Business, Engineering, and Computer Science at UMCP**



## Executive Summary

The traditional approach to college pricing is "one-price-fits-all," regardless of field of study. UMCP proposes differential pricing that is market based for only three degrees—from among the scores of degrees offered—because they meet the stringent test of satisfying each of these five criteria: high demand by students, high cost to teach, high academic quality, high job salaries, and high impact on the state's economy. These are degrees in Business, Engineering, and Computer Science.

Many of our best students are in these majors. Demand for these majors has been soaring. Differential pricing will provide the means to enrich their education and increase the value of their degrees; attract more top in-state students; and strengthen the excellence and national standing the State's flagship university. These results will, in turn, help spur innovation and economic growth in Maryland.

The majority of public AAU universities have differential pricing. All Big Ten flagships—except UMCP—have differential pricing.

Our proposal is reasonable and equitable. First, the differential is benchmarked to the Big Ten median: $5,600 for the degree ($1,400/year X 4 years). This sum is invested in students in these majors to enhance their educational experiences and expand their educational opportunities.

Second, the differential is back-loaded in the junior and senior years. This is fair because students often change majors before their junior year. The differential will cover about 20% of undergraduates on campus.

Third, the differential is phased-in slowly—over four years—so students have time to plan and adjust for it in advance. Initially (FY16), the partial differential will be $700. By the start of the fourth year

(FY19) and thereafter, the full differential ($5,600) will be in effect.

Because of this phased-in schedule, the proposed differential pricing increases the cost of the degree in incremental steps, starting at a 2% increase for current juniors (FY16 graduates) and topping out at a 15% increase for future juniors and seniors (FY19 graduates and thereafter).

Even with the differential added, the price of the degree in these fields for UMCP students would still be near the bottom of that of Big Ten flagships.

Yet, the median annual household income of UMCP's resident freshmen ($120,000) is higher than the statewide median ($72,000), which is higher than the national median and the Big Ten states' median ($52,000). Most of our students graduate debt free. The others have debt and default rates that are much lower than the state and national averages.

The "cost" of attending college is also an "investment" that generates a financial return over a lifetime. Upon graduation, our students in Business and STEM (science, technology, engineering, mathematics) majors have higher job placement and starting salaries than their peers in other fields.

No Big Ten school reports any adverse impact from differential pricing on applications or enrollments in any major, including for underrepresented minority students. We do not expect the results at UMCP to be any different.

UMCP leads the state in STEM degrees awarded, including to underrepresented minorities. Over the past dozen years, UMCP has produced more degrees at a lower cost per degree, despite a substantial decline in state funding per degree and only a modest increase in tuition, both inflation-adjusted.

The projected gross revenue from differential pricing during the phase-in years is $4M in FY16 and $8M in FY17. After full implementation, it will be $16M/year. The benefits that students in these majors will get from differential pricing are the following:

- Enriched academic experience: 65% will be invested to hire about 23 new faculty members and reduce class sizes; expand career services, internships, and student research; and upgrade labs.
- More financial aid: 25% of the total will be reserved for grants for all very-low and low-income students as well as full scholarship students, thereby exempting them from the differential.
- Expanded enrollment: 10% will go to enroll 60 additional students and create two new minors for 700 students.

Differential pricing is an idea whose time has come. *We propose it because we believe it is good academic policy and good public policy, regardless of any State budgetary actions at any given time.*

The philosophical basis of this proposal is that public higher education is a public good and a private benefit. It is reasonable and fair to ask the beneficiaries of a flagship-quality education to make an added investment in selected fields of study that are high cost, high demand, highly compensated and of high value to society.

Differential pricing is also equitable because there will be less cross-subsidization of higher cost majors by lower cost majors. This will enable us to preserve the quality of other majors that are central to the University's educational and research missions but are less costly to teach.

## The Case for Differential Pricing of Degrees

We pinpointed three majors for differential pricing on the basis of meeting all five criteria: (1) high cost of instruction; (2) high demand by students; (3) high national standing; (4) high placement rate and salary upon graduation; and (5) high economic impact on the state.

***1. High cost of instruction***

The cost of education for some majors varies substantially due to many factors, such as different faculty salaries, the cost of labs and equipment, etc. For example, the cost per credit-hour for undergraduates is $130 higher in Engineering and $85 higher in Business than the average of other majors.

***2. High student demand***

At UMCP, there is enormous demand for these majors. For example, over the last 6 years, the number of majors in Engineering has risen by 45% (from 2,800 to 4,000) and in Computer Science by 140% (from 900 to 2,200). The majors in Business have remained stable (2,900), but only because the business school caps its enrollment to preserve instructional quality. Business and Engineering turn away many highly qualified applicants.

In the "one-price-fits-all" approach, the higher cost to educate some majors is spread among all students. Therefore, we have reallocated funds from lower cost to higher cost programs. This partial cross-subsidization is constrained by the need to preserve academic quality in lower cost programs.

***3. High national standing***

These programs are among the most highly ranked nationally at UMCP, ranging from top 20 to top 10 among public research universities. Academic quality and institutional reputation are directly related to program support (e.g., expenditures per student, class size, etc.). Students are generally willing to invest more in a highly valued program and degree. Differential pricing will strengthen these programs' quality and the overall standing of the University.

***4. High employment rate and high compensation***

It is reasonable and fair that students who benefit from higher-cost education should bear these added costs, rather than spread them across all students in all majors, especially since graduates in these three majors have more job opportunities and higher starting salaries.

On average, the return on investment (ROI) on the cost of college is about $1M more in earnings over a lifetime compared to high school graduates. ROI is higher for graduates in these three majors (*Footnote 1, page 9*). Differential pricing will likely increase ROI because of the enhanced quality of the education and, hence, the added value to the UMCP degree.

At graduation, 85% of our Business, Engineering, and Computer Science majors have jobs or have been accepted into graduate studies. Their overall median starting salary is about $60,000. For all other majors, the corresponding figures are 70% and $35,000.

The National Association of Colleges and Employers report that these three majors are "the most profitable." The average lifetime earnings are as follows: Engineering, $3.5M; Business Management, $3.3M; Computer Science, $3.1M. (USA Today, January 31, 2015.) In our recently completed $1B fundraising campaign, 44% of the total came from donors in these three fields.

***5. High impact on state economic development***

Economic growth and job creation is a top state and UMCP priority. Most of the successful companies started by our students and alumni are from Business and STEM fields.

Pitch-Book, the California venture capital firm, recently ranked UMCP 10th among public universities and 30th among all universities in the number of new companies created by undergraduates and backed by venture capital. In recent years, 81 UMCP students started 72 companies that received a total of $362 million in venture capital. Last year, 100 undergraduates launched "Start-up Shell," an incubator and proto-typing lab. Already, it has spawned 34 new companies.

Differential pricing will strengthen UMCP's capabilities to educate the next generation of innovators and entrepreneurs who start successful businesses and not-for-profits.

## Differential Pricing at Big Ten Flagship Universities

Of the 35 AAU public research universities in the country, most (60%) have differential pricing for various programs, including Business and select STEM majors. (*See Appendix A, page 11.)*

Every Big Ten flagship—except UMCP—has differential pricing for Business and Engineering; most have it for Computer Science as well. The median pricing differential at Big Ten peers is $5,600. This is on top of base tuition and fees that are already significantly higher than that of UMCP, which is $9,500/year for residents. (*Footnote 2, page 9*.) For example:

- Penn State (ranked 14th nationally), has a differential of $1,462/year for business, engineering, and sciences. This is on top of base in-state tuition and fees of $17,500/year for freshmen and sophomores and $18,800/year for juniors and seniors.
- University of Illinois (ranked 11th nationally) has differential of $5,004/year for business, engineering, computer science, and other fields. Its base in-state tuition and fees are $15,600/year.

***Impact of Differential Pricing on Enrollments and on Low Income/Minority Students***

We surveyed admissions directors of Big Ten schools. All reported that differential pricing had no negative impact on enrollment in any major, or on enrollment of low-income students and under-represented minorities.

Our Senior VP and Provost Mary Ann Rankin was Dean of Science at the University of Texas when it instituted differential pricing. Far from suppressing demand, she can attest that, thereafter, enrollments overall and enrollments of low-income students in these fields increased. This seemingly counter-intuitive result makes economic sense: differential pricing allowed the institution to expand capacity in high demand majors, improve program quality, and increase financial aid. (*Footnote 3, page 9*.)

We have no reason to expect the impact will be any different at UMCP, given the demographic profile of our undergraduates (described below, p.7) and high student demand in these fields.

## UMCP's Proposed Differential Pricing

We propose a reasonable and equitable differential pricing plan that is (1) back-loaded to the junior and senior years, (2) benchmarked to Big Ten peers, and (3) phased-in incrementally over 4 years.

***Differential is deferred to the junior and senior years in these three majors***
It is equitable to "back-load" differential pricing because juniors and seniors are very likely to graduate. We do not apply the differential to freshmen and sophomores because many of them change their majors before the junior year. We also want to encourage these students to explore introductory courses in these three fields. They will also benefit from enhancements resulting from the differential.

Of the scores of other majors offered at UMCP, many majors (e.g., Physics, Music, Life Sciences, etc.) meet most but not all five selection criteria. Therefore, they were not included in this proposal.

Differential pricing will affect the 5,700 juniors and seniors in these three majors. They comprise about 20% of the entire undergraduate population.

***Differential is benchmarked to the median differential of Big Ten flagships***
The median differential—the 50th percentile—at Big Ten flagships is $5,600 spread over four years ($1,400/year X 4). We propose the same $5,600 differential but apply it only to majors who reach the junior and senior years ($2,800/year X 2). Students with double majors (e.g., engineering and computer science, or engineering and business) would pay the differential only once.

***Differential is phased-in gradually over 4 years:***
***Cost of degree increases from 2% (at phase-in) to 15% (at full implementation)***
To enable students in these three majors to plan in advance for differential pricing, it will be phased in incrementally. The differential will increase the cost of the degree (currently $38,000) as follows:

- FY16: current juniors (graduating class of '16): 2% increase.
  Partial differential is $700 in FY16 (senior year).
- FY16 and FY17: current sophomores (graduating class of '17): 6% increase.
  Partial differential is $700 in FY16 (junior year) and $1400 in FY17 (senior year).
- FY17 and FY18: current freshmen (graduating class of '18): 11% increase.
  Partial differential is $1,400 in FY17 (junior year) and full differential is $2,800 in FY18 (senior year). This is the transition year.
- FY19 and beyond: future students (starting with graduating class of '19): 15% increase.
  Full differential is $2,800 in FY18 (junior year) and $2,800 in FY19 (senior year).

Of course, the full educational benefits and the full enhanced value of the degree made possible by differential pricing would not be realized until the full differential is implemented. The differential in the future would rise proportionately with any increases in base tuition. Hence, the differential as a percentage of the base tuition and fees would remain the same.

***Lower cost of UMCP degree compared to the median cost Big Ten flagship degree***
The cost to acquire a UMCP degree in these fields—base tuition plus the differential—will still be substantially lower than the median cost of these degrees at Big Ten flagships.

For example, the in-state cost of a UMCP degree in Engineering would be $43,600 (= $38,000 + $5,600). The median in-state cost of an Engineering degree (including the differential) at a Big Ten flagship is $59,900. Hence, this UMD degree is about $16,000 less expensive.

***Differential pricing and the total cost of education (tuition and fees plus state funding)***
The total cost of educating a student is the sum of tuition and fees plus appropriations. In FY15, the total cost per student at UMCP is $118,800 over 4 years. In-state students pay tuition and fees of

$38,000 ($9,500/year X 4 years), or 32% of the total cost. The State provides a subsidy of $80,800 ($20,220/year X 4 years), or 68% of the total cost. Non-residents pay the entire total cost (no subsidy).

The full differential in FY19 increases the in-state student's share of the total cost to $43,600 (= $38,000 + $5,600). Hence, due to differential pricing, the student's share of the total cost rises from 32% to 37%. Conversely, the State's share of the total cost drops from 68% to 63%.

Business, Engineering, and Computer Science are among the fields of economic utility to society. Hence, graduates in these fields have lifetime opportunities because of their degree. The public policy issue is the appropriate balance between public and private financing of these degrees.

With differential pricing, an in-state student shoulders an additional 5 percentage points of the total cost of a flagship education. The beneficiary of a flagship degree will still pay under 40% of the total cost, while taxpayers will still pay over 60%. We believe this remains an appropriate balance.

**Revenues and Investments from Differential Pricing**

Differential pricing would generate about $4M in FY16 and $8M in FY17. Differential pricing in FY18 and thereafter would generate about $16M/year, assuming current enrollment levels.

| Major | Juniors and Seniors | Revenue | | |
|---|---|---|---|---|
| | | $700 in FY16 | $1,400 in FY17 | $2,800/yr. FY18+ |
| Business | 2,100 | $1,470,000 | $2,940,000 | $5,880,000 |
| Engineering | 2,600 | $1,820,000 | $3,640,000 | $7,280,000 |
| Computer Science | 1,000 | $700,000 | $1,400,000 | $2,800,000 |
| Total | 5,700 | $3,990,000 | $7,980,000 | $15,960,000 |

This revenue would be invested in three areas that directly benefit students in these majors:

***1. Enriched academic experience: 65% of the revenue***

Most of the pricing differential will be invested to enhance the academic quality and competitiveness of these three programs vis-à-vis their counterparts at other flagships with which we compete for students, faculty, and research dollars. To improve the educational experience, it is essential to hire more faculty members in order to reduce the undergraduate student/faculty ratio (SFR), reduce class sizes, and strengthen research and innovation.

For comparison, the overall UMCP SFR is 18:1. Full differential pricing by FY19 will result in the hiring of about 23 new full-time faculty members and the ensuing improvements in SFR:

- Business: 5 new professors; new SFR = 27:1, current SFR = 29:1.
- Engineering: 12 new professors; new SFR = 20:1; current SFR = 21:1 (but is as high as 31:1 in some departments).
- Computer Science: 6 new professors; new SFR = 74:1; current SFR = 93:1. *(Footnote 4, page 9.)*

Differential pricing will also be invested in order to:

- Hire more academic advisors, teaching lab technicians, and career services/placement personnel.
- Increase student opportunities for supervised research and internships.
- Improve instructional infrastructure: upgrade lab instrumentation, computing facilities, and learning technologies; create more incubator spaces for student start-ups.

***2. More financial aid: 25% of the revenue***

UMCP will reserve one-fourth of the revenue for financial aid: $1M in FY16; $2M in FY17; and $4M in FY18 and beyond. There will be no increase in the net cost of education to (a) Pell grant-eligible low income students; (b) low income students with expected family contribution of under $8,000 per year; and (c) students on full scholarships.

***3. Enrollment growth: 10% of the revenue***

As indicated previously (p. 3), since 2008 the number of majors in Engineering has soared 45% (increase of 1,200 to 4,000) and in Computer Science 140% (increase of 1,300 to 2,200). In FY13, the State provided enhancement funding for 400 new STEM majors, at $18,000 per major. We have already exceeded this goal due to intense student demand.

With full differential pricing by FY19, there will be modest enrollment expansion. At $18,000 per major, Engineering will add about 40 more majors (to 4,040) and Computer Science will add about 20 more (to 2,220). The demand by highly qualified students is greater than this modest increase. However, our greater need is to enhance the educational experience of current students, given the large enrollment increases in recent years without corresponding enrollment funding.

To accommodate this enrollment growth, both disciplines have new, large, and state-of-the-art instructional and research buildings in the construction pipeline. They are made possible by significant private gifts that were leveraged for state capital funding: the A. James Clark Bioengineering Building and the Brendan Iribe Center for Computer Science and Innovation.

Business will maintain its limited enrollment policy to preserve its quality and because of building space constraints. However, it will use the differential to create a new, two-year minor in "General Business" and a second new minor in "Innovation and Entrepreneurship."

These minors are expected to serve over 700 students from across the campus. Many UMCP students will then have access to courses that they want but currently cannot have, unless they are enrolled in the Smith School of Business. Many of the new courses will also be available to Business majors.

## The Flagship Context of Differential Pricing

***Academic and demographic profile of UMCP students***

Relevant to the consideration of differential pricing is the academic, demographic, and economic profile of students in the State's flagship university. It is a distinctive profile that supports a reasonable differential to underwrite educational enhancements that would not otherwise be feasible absent increased state funding.

Academic profile: Today, the freshman GPA average is 4.1; SAT midpoint is 1315; 6-year graduation rate is 85%. This student profile places UMCP among the top 10 public research universities. (For students in these three majors, the scores are even higher.) UMCP leads the state in granting STEM degrees, about 2,300/year.

Demographic profile: Today, minority students comprise 42% of the freshman class.

Household income: The median household income in the State of Maryland is $72,000, the highest in the nation. In the U.S., including in the Big Ten states, the corresponding figure is $52,000. The

median household income of in-state UMCP freshmen is $120,000; of non-resident freshmen, $140,000; and of in-state transfer residents, $70,000.

Student debt: About 55% of UMCP undergraduates earn their degrees debt free. The remainder graduate with debt averaging $25,000, with a 2% default rate. These figures are lower than national figures: 35% graduate without debt; average debt is $30,000; default rate is 14%. They are also lower than our State's averages.

Low income students: Pell grant-eligible students comprise 19% of UMCP undergraduates, which is lower than at Big Ten peers. Under the current low tuition/low aid model, UMCP has fewer resources for grants—whether for Pell-eligible students or for merit award—than peer institutions with a relatively higher tuition/higher aid model. (*Footnote 5, page 10*.)

***Efficiency in UMCP degree production***

Appendix B (page 12) shows that UMCP's total degree production rose 39% from FY02 to FY14. It also shows that UMCP's costs per degree—tuition and fees plus state appropriations—declined 21% in the same period, adjusted for inflation.

This demonstrates that *UMCP is producing more output at a lower cost per unit—the economic definition of efficiency*.

Appendix B also shows that, during the FY02 to FY14 period, net tuition and fees per degree rose an inflation-adjusted 7%, but state funding per degree plummeted an inflation-adjusted 40%.

Appendix C (page 13) shows that in-state tuition and fees in real terms (adjusted for inflation) from FY02 to FY14 increased only 1%, whereas out-of-state tuition and fees in the same period soared 24%.

Given this overall trend of declining state support, it is all the more remarkable that UMCP was able to lower the cost of production per degree by 21%. UMCP has over-achieved in degree production, though not without potential risk to academic quality, which differential pricing would help remedy.

From the foregoing three graphs, one can draw the following policy implications:

First, *there is a market basis for a reasonable pricing differential* for selected high cost, high demand programs. Reasonableness is defined as the median of Big Ten peers.

Second, given the trend of relatively large decreases in state funding per degree, and the relatively modest increases in in-state tuition and fees per degree, *there is the risk that academic programs—especially the high cost, signature programs—will start slipping in value, quality, and national reputation,* if there are not additional resources to off-set the declining state funding. (*Footnote 6, page 10*.)

**Conclusion: Affordable Flagship Excellence and Access in Today's "New Normal"**

UMCP serves Marylanders and the State by being affordable and academically front-rank—a flagship that is "equal to the best" in the nation, as our State mandate reads. We interpret "equal to the best" to mean among the top 10 flagships. This is a goal that we believe we can attain, and that we are resolved to attain, within the next five to ten years.

Some of our premier programs are at risk of falling behind those at peer flagships because the resources required for flagship excellence have not been equal to the demand. When a top-15 program such as Computer Science—critical to innovation, cyber-defense, and state economic vitality—reaches a faculty/student ratio that is five times greater than the rest of the University, it is a call to action.

When high-achieving students cannot enroll in Engineering or Business because these programs lack the resources to accommodate them, and when their parents tell us that they are willing to pay extra at UMCP rather than pay higher non-resident tuition at flagships in VA, NC, PA, MI, OH, NY and elsewhere, we need to think more creatively about our one-tuition-fits-all model.

Today, UMCP attracts about 27% of the very best high school graduates in the state. This percentage should and can rise higher. Differential pricing complements state funding to enable UMCP to preserve and enhance its excellence and thereby attract and enroll more of these talented Marylanders. If we can meet the demand for an education "equal to the best," more of these top students will come to UMCP, and they will more likely live and work in Maryland after graduation.

In today's "new normal" of constrained state funding, we propose that the beneficiaries of a flagship-quality education make an increased investment in the value of their degree in fields that are high cost, high demand, and highly compensated. It will be fully phased-in in the fourth year, starting in FY16 at a 2% differential and topping off in FY19 at a 15% differential. In return, this increased investment will enhance the quality of their education and the market value of their degree. Over time, it will also bolster the State flagship's national standing and the economic vitality of Maryland.

## Footnotes

**Fn. 1, from page 3**
"2014 PayScale College ROI Report" (www.payscale.com) estimates that the average UMCP graduate with a baccalaureate degree has an 8.5% annualized net return on investment over a 30-year career, and a 9.9% annualized net ROI if the graduate received the institution's average financial aid package. The net ROI for graduates in Business, Engineering, and Computer Science is higher than for graduates in other fields.

**Fn. 2, from page 4**
UMCP's in-state tuition and fees of $9,500/year is about $2,300 below the median of Big Ten flagships. It is also about $3,800 below the median of the 16 AAU public institutions in competitor states. (They include, for example, several Big Ten schools and UNC, UCLA, Berkeley). In both benchmarks, UMCP is near the bottom of its peers in resident tuition and fees. For competitive excellence, the Bohanan Commission recommended that it be set at the median of the 16 public peers.

**Fn. 3, from page 4**
Economist Thorstein Veblen in 1899 noted an exception to the law of demand—that demand moves conversely to price. He observed that with "high status" goods, such as a degree from a highly regarded school, an increase in price does not decrease demand; instead, it makes the good appear more valuable and preferable. It thereby increases demand. This is the basis for the popular impression that "price is quality."

**Fn. 4, from page 6**
These student/faculty ratios are the number of unduplicated majors divided by the number of full-time

equivalent (FTE) tenured and tenure-track faculty in that college or department. Must Business and Engineering faculty have full-time appointments in their college, so the number of FTE is roughly equal to the faculty head-count. Most Computer Science faculty members have joint appointments with the University of Maryland Institute for Advanced Computer Studies. Hence, the 64 tenured or tenure-track professors in Computer Science contribute only 23.4 FTE. The addition of 6 FTE faculty members to Computer Science would require hiring about 12 faculty members.

**Fn. 5, from page 8**
UMCP's institutional aid per student averages only about $1,800. Because of our low tuition/low aid model, *we have nearly the lowest per student financial support among Big Ten flagships*. For example, the average aid at Michigan is over $5,000; Iowa, $2,750; Ohio State, $2,500.

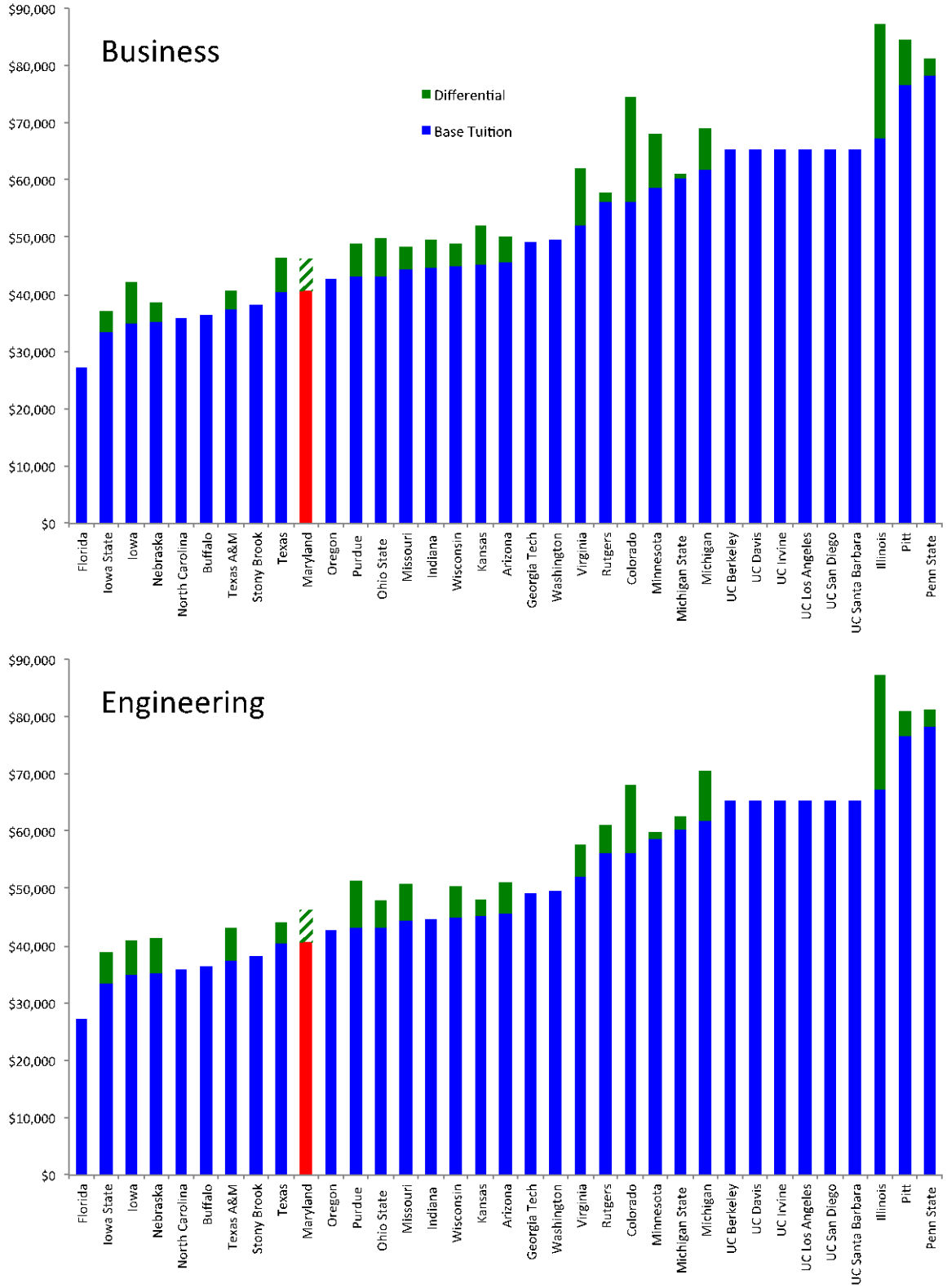
**Fn. 6, from page 8**
In FY02, UMCP's expenditures per student (tuition & fees + state appropriations) were $2,500 below that the average of our traditional aspirational peers (e.g., Michigan, Illinois, UNC, Berkeley, UCLA). By FY12, this gap had grown to $4,000. (Source: IPEDS Enrollment and Finance surveys.) *This growing gap in per capita funding puts at risks the institution's academic excellence and national reputation.*

We have done statistical analyses that show—unsurprisingly—a direct correlation between expenditures per student (a marker of academic quality) and the academic standing of the institution. As these expenditures decline, the academic standing subsequently falls; conversely, when these expenditures increase, the academic standing subsequently rises.

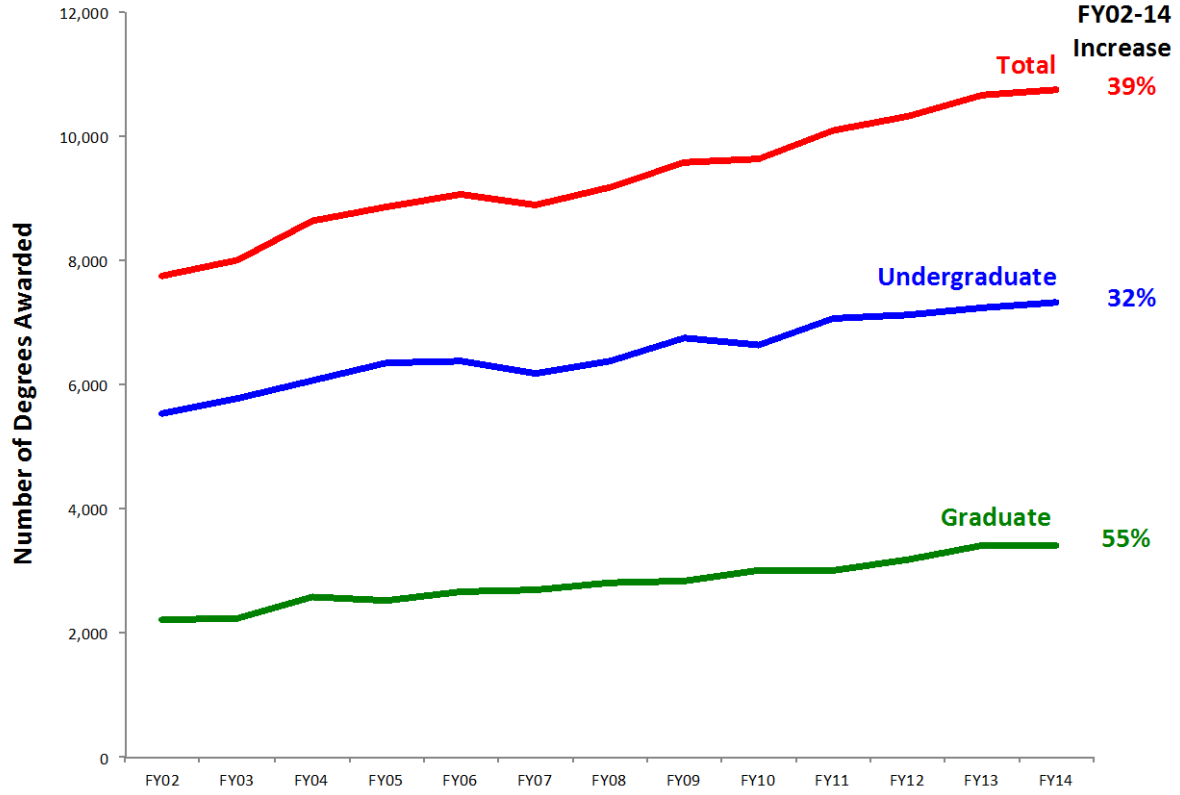
*Our analyses also show that while UMCP is under-resourced, to date we have still over-performed*. On resource measures (e.g., expenditures per student, student-faculty ratio, class size, faculty compensation, etc.), we are ranked between 41st and 98th in the country among public institutions. On academic performance measures (e.g., quality of our student body; retention rates; graduation rates; etc.), we are ranked 15th to 20th—higher on these measures, in fact, than some peer flagships that spend more per student. However, these peers have higher overall standing because resources matter.

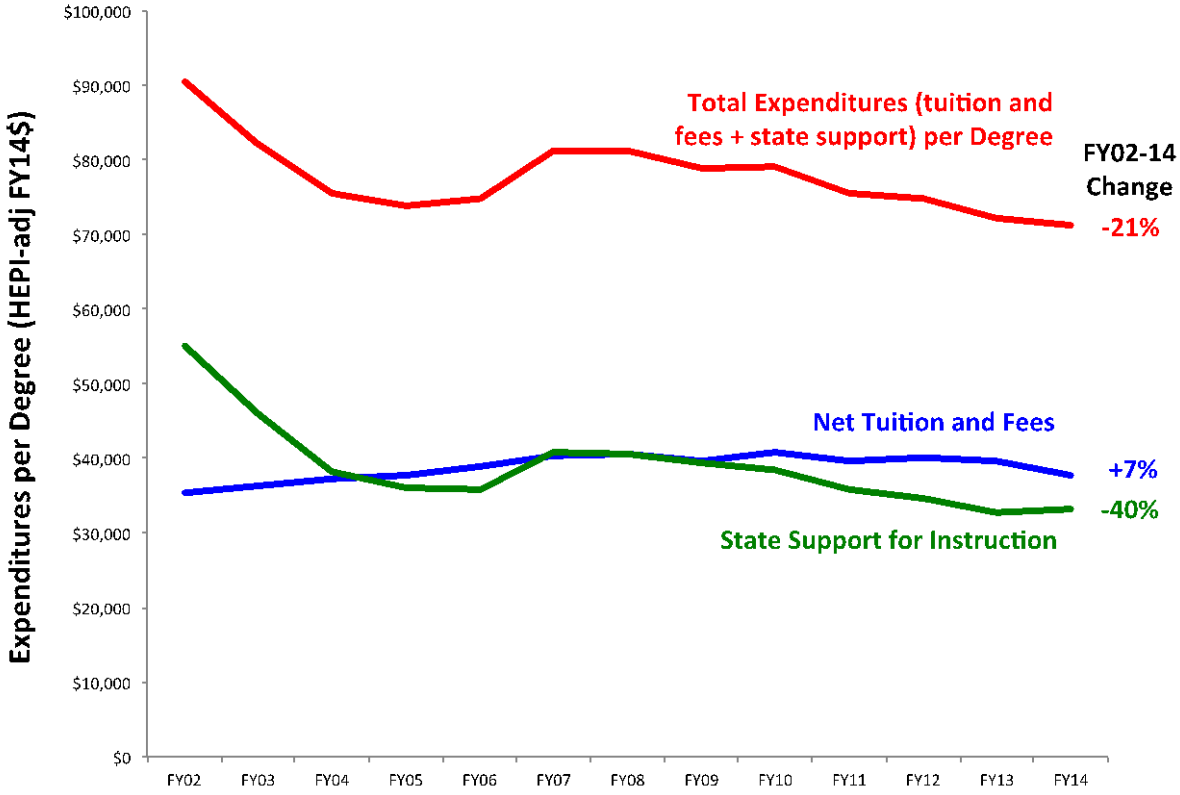
Differential pricing will help ameliorate the under-resourcing and lift the University's overall academic profile. Because it is applied to only 20% of the undergraduates, the impact will likely be modest. Nonetheless, the implementation of differential pricing will be an important step in UMCP's ascent to be "equal to the best" flagships in the nation.

**Appendix A.** The cost of a bachelor's degree in business and in engineering (base + pricing differential) over 4 years at all AAU public universities. (UMCP is the red bar.)

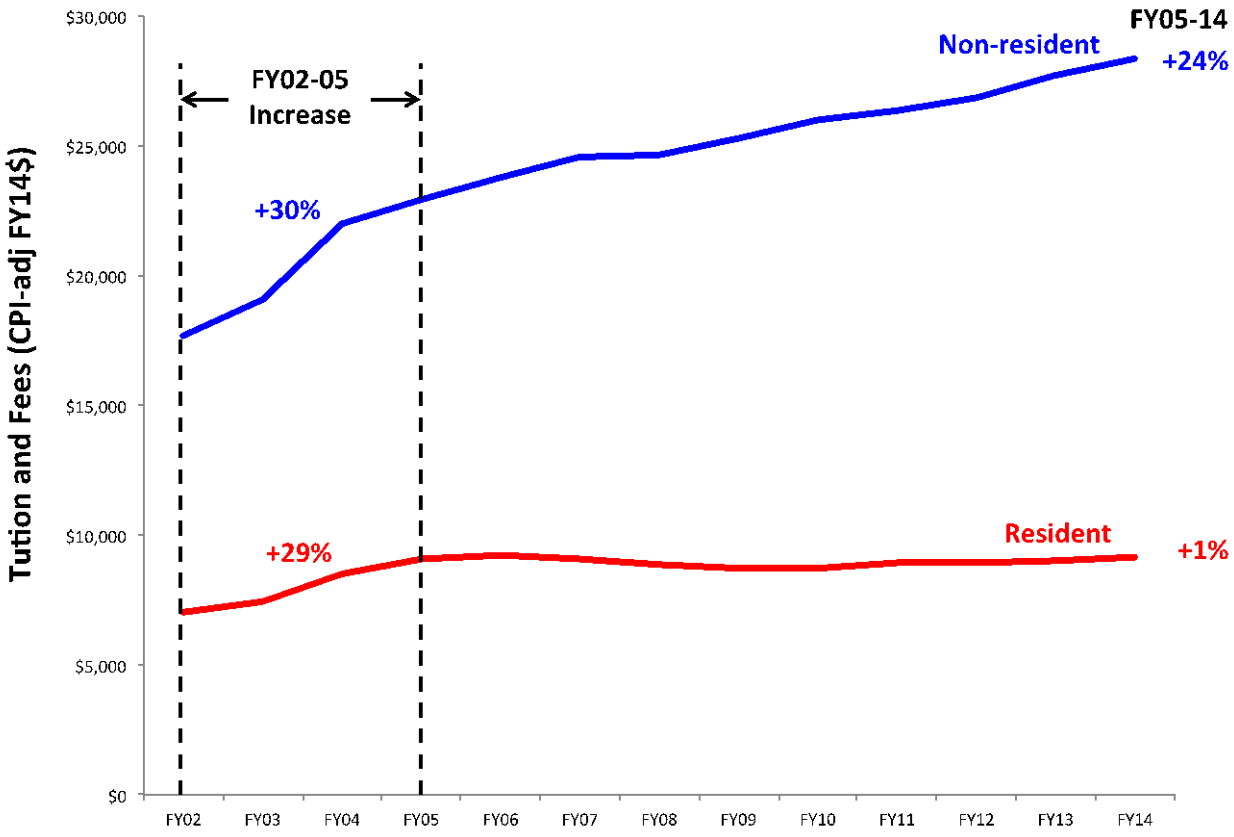


**Appendix B**. Top graph: UMCP's increased degree production, FY02 – FY14.
Bottom graph: UMCP's decreased cost per degree produced, FY02 – FY14;
also, UMCP's tuition/fees and state appropriations per degree, FY02 – FY14.



**Appendix C**. UMCP's resident and non-resident tuition and fees adjusted for inflation, FY02-14.



## Letters of Deans in Support of Differential Pricing in Engineering, Business, and Computer Science:

1. Letter of Dean Darryll Pines, A. James Clark School of Engineering, UMCP

2. Letter of Dean Alex Triantis, Robert H. Smith School of Business, UMCP

3. Letter of Dean Jayanth Banavar, College of Computer, Mathematical, and Natural Sciences

A. JAMES CLARK
SCHOOL OF ENGINEERING

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May 1, 2015

Board of Regents
University System of Maryland
Adelphi, Maryland

Dear Board of Regent Member,

The A. James Clark School of Engineering is one of the largest undergraduate and graduate engineering programs in the nation and represents the Flagship engineering program in D.C., Maryland, and Northern Virginia area. The Clark School now has over 6,000 total students. Of these, more than 4,000 are undergraduates, which represents a **43%** increase from a Fall 2008 enrollment of 2800 students. Annually, the Clark School confers degrees to approximately **1300** BS, MS, MEng, and Ph.D. candidates.

Our undergraduate and graduate students are in very high demand by industry, government, and academia. In fact, a recent poll by the website payscale.com lists that the top 15 jobs for college graduates are all related to **engineering** or **computer science**. Students leaving the Clark School with a Bachelor of Science degree in engineering command an average starting salary of **$68,000**. As they progress in their careers, these graduates often reach the highest level of corporate management in many of America's *Fortune 500* firms. These graduates include technical, business, and entrepreneurial leaders who have made significant contributions to the State of Maryland, the nation, and society. They include pioneers such as:

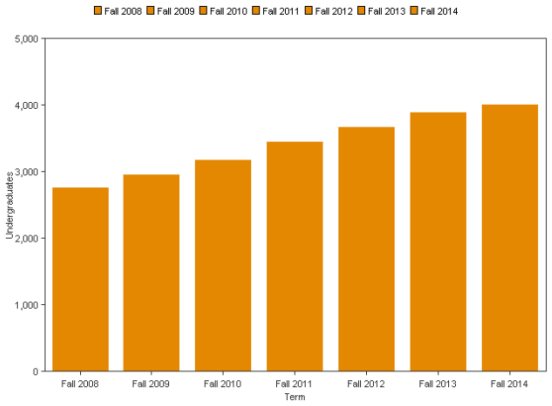
- A. James Clark,'50, CEO/President of Clark Enterprises, 8$^{th}$ largest constr. firm in US
- Jeong H. Kim, '90, former President Alcatel-Lucent, inventor of switch relay for telecom
- Tim Regan,'77, CEO/President of Whiting Turner, 11$^{th}$ largest constr. firm in US
- Edward St. John, '61, CEO/President of St. John Properties
- George Laurer, '51, former IBM employee, Inventor of the University Product Code
- Rob Briskman, '61, founder of Sirius Satellite Digital Radio
- Brian Hinman, '85, serial entrepreneur, and inventor, Polycom Teleconference Systems
- Judith Resnik,'77, and Jeanette Epps, '00, NASA Astronauts

Over the past five years, the A. James Clark School of Engineering has enjoyed an unprecedented level of success as a result of support from USM, campus administration, and the hard work of its faculty, staff and students. Their tireless commitment to academic excellence in undergraduate, graduate, research and entrepreneurial programs has moved the school in a positive direction. This unwavering commitment has placed the college among the *top 15 public engineering schools* in the nation at both the undergraduate (*11th*) and graduate (*11th*) level when ranked against its peer institutions by *US News and World Report-2015*. In addition, a recent *2015 US News Best Online Graduate Program* poll ranks the Clark School *8th* among *public institutions* and *13$^{th}$ overall* against all public and private institutions. However, these

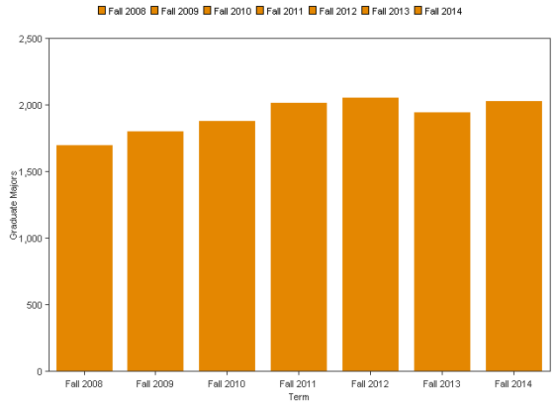
significant gains are in jeopardy if the college is not allowed to develop a *new financial model* to keep pace with peer public institutions including *BigTen* Schools such as the University of Illinois-Urbana, University of Michigan, University of Wisconsin, Purdue University, Pennsylvania State Univ., and other publics such as University of Texas-Austin, Texas A&M University, Virginia Tech, UCLA, UC Santa Barbara, and UC San Diego.

**Challenges:**

Since 2008, the A. James Clark School of Engineering has added a net of only **10** full-time equivalent new tenure/tenure track faculty positions and has experienced rapid growth (See insert figures below) in student undergraduate and graduate enrollment (>1500 total above 2008 baseline numbers). This growth combined with a lack of sufficient faculty/staff resources poses a serious risk to our ability to provide a high-quality engineering education and keep pace with our peers. The College must have sufficient resources to provide adequate laboratory facilities, support student experiential projects and competitions, upgrade instrumentation and software tools, achieve a reasonable student to faculty ratio, and retain the best of our faculty and staff.




Undergraduate Enrollment Trend




Graduate Enrollment Trend

Some of the specific challenges include:

- **Class Size:** The number of students enrolling in our key freshmen classes including ENES100 and ENES 102 has been steadily increasing. Data from our signature *Keystone* program suggests that student success and retention is based on reasonable class sizes, mentoring, tutoring, and high quality instruction. The number of students in each section needs to be reduced to provide a more meaningful introductory engineering design experience.
- **Facilities:** To provide a relevant engineering education and prepare students for entry into the workforce, it is imperative that our equipment and laboratories keep pace with advancing technologies. Thus, *A. James Clark Hall* must be fully funded from FY16 to FY18 to ensure adequate space to address growing research and enrollment needs.
- **Faculty/Staff Hiring:** The hiring of new faculty and staff to keep pace with the growth in student enrollment, and research competitiveness requires new resources.
- **Financial Aid and Diversity:** The recruitment of underrepresented minority and female students is a challenge. In the past 5 years, the Clark School has made significant strides in recruiting, retaining, and graduating both minority students and female students, however, there is still much to be done that require our utmost attention. While the Clark School numbers are above the national averages in recruitment, retention and graduation of underrepresented students, the level of competition for these students from our peer

institutions is fierce. In order to attract the best from the state of Maryland, we must be able to compete with other schools with regard to financial aid packages. New financial resources derived from differential pricing will make this possible.

**Rationale for Differential Pricing:**

We owe it to our undergraduate and graduate students to deliver them a *first-class high value* engineering education. We believe that implementing differential pricing will ensure that adequate resources are available to offer quality instructional and research programs in the Clark School and keep the very best students in the State of Maryland. Below are some of the considerations when developing a budget to fund our undergraduate and graduate programs:

- Driven by competition with other universities and the private sector, engineering faculty and staff salaries most be competitive to continue to attract the best talent;
- The scope of engineering is expanding to include non-traditional areas such as nanotechnology (Nano-FabLab), biomedical engineering and health sciences, virtual reality and augmented reality, quantum optics, communication, engineering and computing, and cybersecurity, which require increasingly sophisticated facilities which are expensive to install and maintain (e.g., nano-bio initiative). This is why it is important to ensure that *A. James Clark Hall* which will house state of the art space for all of engineering stays on schedule for construction and completion by Summer of 2017;
- Rapid advances in technology and the move towards blended learning require frequent upgrades to teaching laboratory equipment; and a technologically sophisticated engineering staff to manage and maintain these systems;
- Students are increasingly engaged in rewarding but expensive extracurricular activities, for which they expect the university to provide financial support (e.g., X-Prize Projects such as Gamera-Human Powered Helicopter, Engineers Without Borders-EWB, SAE Car Competitions, Robotics@ Maryland Club, Solar Decathlon, and other National and International student design competition teams).

Recognizing these expenses, many of our peer institutions have adopted differential pricing/fees for business and engineering majors, typically in the range from $1-5k per year range (see table 1 below).

Table 1. Average fee or pricing differential per academic year for full-time undergraduate engineering and business majors at Big Ten public institutions, AY13-14.

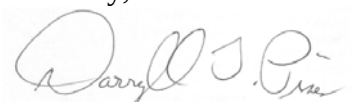
| Institution | Engineering | Business |
|---|---|---|
| Indiana University | N/A | $1,200 |
| Michigan State University* | $567 | $200 |
| Ohio State University | $915 | $1,572 |
| Penn State University* | $1,169 | $1,169 |
| Purdue University | $1,800 | $1,436 |
| Rutgers | $1,520 | $450 |
| University of Illinois | $4,920 | $4,920 |
| University of Iowa* | $1,544 | $1,807 |
| University of Michigan* | $2,137 | $1,434 |
| University of Minnesota | $600 | $2,160 |
| University of Nebraska | $1,560 | $2,805 |
| University of Wisconsin | $1,400 | $1,000 |
| Median | **$1,520** | $1,435 |

*Fee/differential varies by class standing; average rate over 4 years given.

**What are the benefits to students and what do they think?**
In addition to a top quality faculty and staff, which currently exists in the Clark School, students must have high quality services, adequate facilities, a competitive diverse peer group, a good learning environment, and state of the art equipment in order to obtain a quality technical education. With differential pricing, we will be able, hire more instructors, teaching assistants, and technicians to improve the learning environment. This will enable us to decrease class sizes, upgrade our laboratory facilities, and recruit a highly competitive diverse peer group of students. Our classrooms and teaching labs will be modernized and provide our students with the environment and tools they need to succeed in their education and future careers.

We have surveyed our student leaders in every discipline within engineering and many agree that the proposed differential pricing will allow the Clark School to provide opportunities to add value to their educational programs and experiences. They believe it will improve the level of learning both inside and outside of the classroom environment with emphasis on more hands-on learning projects, and foster more opportunities to work in teams. Many of our students believe that the enrichment programs described above will add substantial value to our student experience, allowing them to be more marketable and competitive as well as help to put them on a fast track to leadership positions in industry and government.

In order to maintain and improve our quality, and remain competitive, it is critical that we obtain resource parity with our peers. We strongly hope that you will support President Loh's proposal for Differential Pricing, so that we may continue to graduate students who will impact our state, nation and world in a positive way.
Sincerely,



Darryll J. Pines
*Farvardin Professor and Dean*
Clark School of Engineering
University of Maryland


**Alexander J. Triantis**
*Dean*

Office of the Board of Regents
University System of Maryland

May 1, 2015

Dear Regents:

The world's best business schools, including the Robert H. Smith School of Business, compete aggressively for top students, faculty, and corporate recruiters. This competition has advanced these schools significantly by driving innovation in curriculum, pedagogy, and student services. For example, the Smith School continues to refine its undergraduate curriculum to put greater emphasis on experiential learning opportunities, critical thinking skills, and developing both a global and entrepreneurial mindset. Additionally, the Smith School has invested millions of dollars to upgrade the services provided by our Office of Career Services to better prepare our students for their careers, and to connect our students to the most desirable employers. We also continue to find new ways to provide our students with a more personal learning experience where they are highly engaged with faculty, coaches, alumni and other mentors in individual or small group settings.

The improvements in teaching and services at top business schools, coupled with the competition for the best faculty and students, have not surprisingly increased operating costs significantly over recent years. While business schools generate revenue from other sources to support this higher cost of undergraduate education, inevitably some of the higher cost must be borne by students in the form of tuition increases, including differential pricing. However, students and their families continue to choose to invest in a top tier business education given the tremendous value they see from such an education. The evidence supporting this value proposition is not only found in the unprecedented high demand to enroll in top business programs, but also the increasingly higher salaries being offered to graduates of these programs.

The Smith School of Business is in a very precarious position at this point in time. Over the years, the School has managed to attract some of the most highly respected faculty in the world. The Smith School is frequently ranked as a top 10 business school in terms of its research productivity and reputation. This reputation spills over into our #21 ranking by *US News and World Report* for our undergraduate program, a ranking that is based solely on surveys of

business school deans and senior faculty, and thus heavily influenced by their knowledge of our research reputation. However, our ranking by *Bloomberg Business Week*, which is based on student and recruiter surveys, starting salary of our graduates, and measures of educational quality such as faculty/student ratio and average class sizes, is #39 (and #16 among public schools).

This gap between the two rankings reflects that we have not been able to keep up with our peer institutions in terms of the quality of instruction and services we are providing. Our class sizes are too large, we rely on too many lecturers and adjunct faculty, and despite our investment in co-curricular opportunities and career services, we lag behind peer schools. I continue to be frustrated by the inability to fund innovative opportunities that we know would enhance the value of the educational experience we could provide. I am also repeatedly discouraged every time I speak to Maryland high school students (or their parents) who choose to enroll at competing public universities such as Michigan, Penn State, Texas, and Virginia. All of these schools have higher in-state tuition *and* differential pricing that enables them to invest more in their students. The fact that Maryland families are willing to pay even higher out-of-state tuition in order to benefit from the quality of education and reputation of these other institutions indicates that they understand the tremendous return on investment from a top business education, and are willing to make the sacrifices required to send their children to a top tier business school.

Differential pricing can go a long way to closing the quality and reputational gap and improving the value of the undergraduate business experience we could offer. The additional funds would allow us to properly invest in high quality faculty instruction, building up our full-time faculty, and stemming the faculty losses recently experienced due to compensation issues. It will also allow us to enhance student services including more personal coaching and advising, expanded career services, improved global study opportunities, more co-curricular events focused on skill development, networking and job placement, and upgraded classroom technology to enable more simulations and other interactive and collaborative experiences.

Maryland students receive a great return on the current low in-state tuition they pay to get a Bachelor's degree from the Smith School. However, most are willing to pay more to graduate from a business school that has a higher ranking and provides a higher probability of securing a top job placement. The Smith School's Dean's Student Advisory Council (DSAC) conducted an informal survey of Smith School undergraduates last year inquiring about their student experience, and found support for a higher tuition assessed on Smith students that would enable us to invest in better instruction and services. These students have seen the value of experiential and co-curricular activities, including orientation, career coaching, global and entrepreneurial experiences, student engagement activities, and stronger corporate connectivity inside and outside of the classroom. They understand that these types of experiences are not available to all students at the University, and appreciate the value of preserving and enhancing these opportunities. Casual conversations with parents also indicate an understanding for the value proposition offered by an outstanding business school education, and the justification for higher tuition to support such an education.

Business schools that have instituted differential pricing have not found a negative effect on enrollment and student satisfaction, based on my conversations with their deans. In fact, the ability to fund strong student experiences inside and outside of the classroom appear to have strengthened their rankings, and the desirability of enrolling in these business schools. I am confident that we will witness the same reaction here at Maryland. We will be able to strengthen our programs to better compete with our peers, and we will be able to attract the strongest students from Maryland high schools to the Smith School instead of losing them to peer schools. The funds set aside for financial support will ensure that those who may struggle with the higher cost of a business education will receive the necessary assistance. Not only will the Smith School and the University of Maryland benefit from an enhanced reputation, but the increased investment in business education will ensure that the best talent in Maryland will receive the highest quality education and will in turn create and enhance business opportunities in Maryland to ensure the state's long-term economic competitiveness.

I very much hope that the Board will support this important opportunity for the Smith School and the University of Maryland to be able to compete on a level-playing field with our peer schools and ensure that we can achieve our high aspirations of being truly one of the best public universities in this country.

Sincerely,

Alexander J. Triantis
Dean

UNIVERSITY OF MARYLAND

COLLEGE OF COMPUTER, MATHEMATICAL, AND NATURAL SCIENCES
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May 1, 2015

Office of the Board of Regents
University System of Maryland

Dear Regents:

An understanding of computer science is becoming increasingly essential in today's hyper-connected, technology-driven world. Computer science touches every field and drives advancements in health care, aerospace, financial services, national defense, personal security, retail and many other industries. The competitiveness of the state of Maryland depends on our ability to provide an outstanding and forward-thinking education in this critical field to our students and prepare them to be leaders and innovators in the work force.

The wonderful news is that our state boasts a top-ranked computer science department at its flagship institution. The Department of Computer Science at the University of Maryland ranks No. 17 in the world according to the prestigious Academic Ranking of World Universities. The department ranks No. 15 in U.S. News & World Report's 2015 Best Graduate Schools rankings, with three computer science specialties also ranking in the top 20.

The department has provided a world of opportunities for its graduates. Alumni have become professors at top-ranked universities and researchers at well-known industrial labs. They are also entrepreneurs who found successful companies, including Michael Antonov (Scaleform/Oculus VR), David Baggett (Inky), Sergey Brin (Google), Paul Capriolo (Now or Never/Social Growth Technologies), Gary Flake (Clipboard), Brendan Iribe (Scaleform/Oculus VR), Sujal Patel (Isilon Systems), Pooja Sankar (Piazza), Shayan Zadeh (Zoosk/Gear Zero) and more.

Students who are preparing for college and careers are responding to the opportunities presented by the information age and the knowledge economy. UMD's Department of Computer Science has seen a rapid, substantial increase in majors. Enrollment grew from 880 undergraduates in spring 2011 to 1,900 today—a five-year increase of 116%! We have already admitted 200 more freshmen for fall 2015 than were admitted in fall 2014. Computer science is now the highest enrollment major at UMD, comprising nearly 6% of total UMD undergraduate enrollment.

The quality of training that the department is able to provide is severely threatened because it now lacks the faculty, instructors and advisors to adequately serve these students. The department has only eight instructors to teach many of the introductory courses and only three undergraduate academic advisors for 1,900 students. There has been no net increase in the number of tenure-track faculty members in the last four years. Faculty hiring has been offset by retirements, departures and unsuccessful searches in which we lost top candidates to other universities. We have directed additional soft funds to hire lecturers and teaching assistants. However, budget constraints have affected our ability to make major investments. As the student demands increase, we are losing ground in the stature of the research, teaching and service missions of this thriving department.

These shortcomings have resulted in large class sizes (upper-level classes have increased from 35 to 60 students and introductory courses have grown to 140 students), reducing the advising, mentoring, career services and support provided to students. Instructional quality is decreasing because we can't provide critical thinking and active learning opportunities with these large class sizes. In addition, students find it harder to get to know faculty and obtain meaningful reference letters with large class sizes, and harder to hear each other and actively participate in large discussion sessions. The undergraduate demand for courses also limits course offerings for graduate students and limits new course offerings in cutting-edge topics because faculty must teach required undergraduate courses multiple times due to demand. Classrooms also fill up, sometimes causing students to get shut out of classes; if not addressed, this will increase time to degree completion.

Most computer science departments across the country are dealing with similar increases in enrollments, but many are providing funding and resources to improve the quality of computer science education they're delivering to their students. Our highly ranked peers compete with us for students and faculty members and are investing in facilities and faculty. As others boldly move forward, the quality of our programs will suffer if we do not move forward too—the best and brightest students will leave the state of Maryland to attend college, and we will be at an increasing disadvantage to hire the best faculty members.

We recently received $35 million in gifts to create a new home for computer science—and raise its stature as a global leader in virtual reality, robotics, computer vision and immersive science. We also received $3 million for two endowed professorships in computer science. This is a game-changing boost for us. However, to capitalize on this, we are in dire need of resources to preserve and enhance our educational programs. Increased investment in our programs will add value to our students' degrees and, in turn, to the economy of the state and nation.

With the additional funding from differential pricing, our Department of Computer Science will become world-class by recruiting and retaining top tenure-track faculty members who will train and inspire the next generation of computer scientists. We will hire tenure-track faculty who can provide innovative advanced courses and state-of-the-art research opportunities to our students—expertise lecturers cannot provide. The additional resources will also allow us to create new labs and hacker/maker spaces for students, fund advisors who can help students develop innovative and entrepreneurial ideas, and offer more courses to meet the growing demand.

We believe that our alumni community and students will weigh the importance of the quality, reputation and return on investment of their degree, and will support this proposal.

Thank you for considering the differential pricing proposal.

Sincerely,

Jayanth Banavar
Dean
College of Computer, Mathematical, and Natural Sciences