A 31-Year Record of CS Enrollment at a Single Urban Public Institution

Aaron Tenenbaum and Yedidyah Langsam
Department of Computer & Information Science
Brooklyn College of CUNY, Brooklyn, NY
ABSTRACT

• 31-year record of undergraduate and master’s enrollment
• Compared with national trends
• Enrollment in CS0 and CS1
• Enrollment in applications course
• Enrollment policies
• Core vs. Pathways GenEd mandates
BROOKLYN COLLEGE of CUNY

- Middle-Lower class income
- 17000 students
- CIS Department
  - BS in Computer Science
  - BS in Multimedia Computing
  - BS in Information Systems (Joint with Economics)
  - ~550 majors
  - MA in Computer Science
  - MS in Information Systems
  - Coordinated Engineering Honors Program
  - Participates in Ph.D. program with CUNY Graduate Center
Demographics (2013-2014)

- 31% White
- 18% Black or African American
- 15% Hispanic
- 14% Asian
- 22% Other & Unidentified

- 61% Female
- 39% Male
# Demographics (2013-2014)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Undergraduate Students</th>
<th>Graduate Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 20</td>
<td>3,487 (26%)</td>
<td>4 (0%)</td>
</tr>
<tr>
<td>20-24</td>
<td>6,355 (47%)</td>
<td>861 (25%)</td>
</tr>
<tr>
<td>25-29</td>
<td>2,104 (15%)</td>
<td>1,179 (35%)</td>
</tr>
<tr>
<td>30-39</td>
<td>1,129 (8%)</td>
<td>884 (26%)</td>
</tr>
<tr>
<td>40 and over</td>
<td>521 (4%)</td>
<td>480 (14%)</td>
</tr>
</tbody>
</table>

![Graph showing the age distribution of undergraduate and graduate students.](image)
# Programs in Computing

<table>
<thead>
<tr>
<th>Program</th>
<th>Year Begun</th>
<th>Departments</th>
<th># of Majors (Feb. 2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor’s in Computer Science</td>
<td>1974</td>
<td>CIS</td>
<td>289</td>
</tr>
<tr>
<td>Bachelor’s in Computational Mathematics</td>
<td>1972</td>
<td>CIS / Mathematics</td>
<td>9</td>
</tr>
<tr>
<td>Bachelor’s in Information Systems</td>
<td>2006</td>
<td>CIS / Business</td>
<td>82</td>
</tr>
<tr>
<td>Bachelor’s in Multimedia Computing</td>
<td>2006</td>
<td>CIS</td>
<td>43</td>
</tr>
<tr>
<td>Master’s in Computer Science</td>
<td>1977</td>
<td>CIS</td>
<td>61</td>
</tr>
<tr>
<td>Master’s in Information Systems</td>
<td>1989</td>
<td>CIS</td>
<td>66</td>
</tr>
</tbody>
</table>

- 26 full-time faculty
- 15 adjunct faculty
- 3 graduate fellows

- Department founded in 1972
Undergraduate CS Enrollment

- Undergraduate FTE represents 15 credit-hours
- Does not include enrollment in CS0
Causes for the Wide Swings

• Consistent with national trends
  – National economy & job market
  – Shift in nature of computing skills
  – Advent of more user-oriented computing tools
  – HS counselors discourage students from entering computer science
  – Today demand exceeds supply
Total Departmental FTEs
(Undergrad+Grad+CS0)

- Undergraduate FTE represents 15 credit-hours
- Graduate FTE represents 12 credit-hours
Parachute and Free-Fall
The 1983-92 vs. the 2003-07 Reduction

- Undergraduate decline
  - 1983-92 (-32%)
  - 2003-07 (-48%)

- Introduction of college-wide core and graduate students
  - 1980-2002
  - mitigates total FTE drop

- CUNY shifts to initial community college placement
  - 2003-2007
  - students exempt from lower-tier core
Core Computing FTEs
Core at Brooklyn College

• Core introduced in 1980
  – Combined Math/CIS class – taught math using BASIC

• Revised Core in 1985
  – Combined Math/CIS class – low level logic & Programming using Pascal

• Core Split in 2003
  – CIS class – Nature, Power and Limits of Computing
  – JavaScript

• College-wide Core split in 2006
  – Lower-tier: Nature, Power and Limits of Computing
  – Upper-tier: Robotics or Paradoxes and the Limits of Knowledge
Pathways *GenEd* at CUNY

- Mandated as of Fall 2013 by Board of Trustees
- Fierce opposition by faculty
- Lowered number of *GenEd* courses
- Mandated university wide transfer of *GenEd*
- Buckets
  - “*Our Scientific World*”, “*Mathematics & Problem Solving*”
  - “*Creative Expressions*”, “*The Individual & Society*”
    - CIS not included
- College Option
  - Students choose two from among various upper-tier core science courses
  - CIS offers: “*Robotics*” & “*Paradoxes and the Limits of Knowledge*”
Master’s Program Enrollment

[Bar chart showing enrollment trends from 1983 to 2013.]
First-Level Course Enrollment
CS1 & the Computer Applications Course

Programming

Applications

CS1 vs. CA vs. C0 Trends

• **CS1** – Introduction to Programming (currently using C++)
  - Increase as demand for programmers increase
  - Has already caused an increase in advanced courses offered

• **Applications** – Microsoft Office
  - Required by Business & Accounting Programs
  - Will probably drop in enrollment as more students are exempt

• **CO** – *GenEd*
  - College Option (Robotics, Paradoxes) remain strong
  - Lobbying for inclusion in CUNY Common Core buckets.
Conclusion

• Computing course enrollments are cyclical
• National trends vs local idiosyncrasies
• Technological events (e.g. apps, robotics)
• Perception & realities of the job market
• K-12 education trends
Contact Information

Yedidyah Langsam, Ph.D, Chair
Computer & Information Science Department
Brooklyn College of the City University of New York
2900 Bedford Avenue
Brooklyn, NY 11229

langsam@sci.brooklyn.cuny.edu
http://eilat.sci.brooklyn.cuny.edu