Proceedings

Enhancement of the Global Perspective for Engineering Students by Providing an International Experience

Georgia Tech’s Strategies for Global Engineers

Jack R. Lohmann
Georgia Institute of Technology

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Georgia Tech’s Strategies for Global Engineers

Jack R. Lohmann
Associate Provost
Georgia Institute of Technology
Atlanta, Georgia USA
Georgia Tech profile

Top 10 U.S. public research (technological) universities

Fall '02 enrollments

FY '02 degrees

Sources: U.S. News & World Report, 2002 Georgia Tech Fact Book
engineering profile

Largest U.S. producer of engineering graduates

1st in degrees to women and to African-Americans

Largest U.S. voluntary co-op program

Ranked 2nd in engineering R&D

 Ranked 3rd in industry sponsored research

Sources: Engineering Workforce Commission, National Science Foundation, Black Issues in Higher Education
(inter)institutional development

Intentionality (“Value-added”)

Local (Atlanta)

International (Metz, Paris, Singapore)

Regional (Savannah)

Faculty & Student Involvement

Distributed (e)Learning

Educational Effectiveness

Support Infrastructure

Accreditation & Reviews
International Efforts
types of experiences

Study abroad

Degree (&internship) programs
  GTL, Paris Program, TLI-AP

Work (internship) abroad

Distance learning
study abroad enrollments

Undergraduate Students Abroad

<table>
<thead>
<tr>
<th>Year</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>94-95</td>
<td>241</td>
</tr>
<tr>
<td>95-96</td>
<td>291</td>
</tr>
<tr>
<td>96-97</td>
<td>333</td>
</tr>
<tr>
<td>97-98</td>
<td>485</td>
</tr>
<tr>
<td>98-99</td>
<td>491</td>
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<tr>
<td>99-00</td>
<td>574</td>
</tr>
<tr>
<td>00-01</td>
<td>748</td>
</tr>
<tr>
<td>01-02</td>
<td>766</td>
</tr>
</tbody>
</table>

35.3% of undergraduate degrees conferred

Source: 2002 Georgia Tech Fact Book
# Study Abroad Programs

<table>
<thead>
<tr>
<th>Program</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxford Summer Program</td>
<td>156</td>
</tr>
<tr>
<td>GTL Summer Program</td>
<td>104</td>
</tr>
<tr>
<td>Pacific Study Abroad Program</td>
<td>86</td>
</tr>
<tr>
<td>Computing Summer Program in Barcelona</td>
<td>55</td>
</tr>
<tr>
<td>Languages for Business and Technology</td>
<td>54</td>
</tr>
<tr>
<td>Hong Kong/Singapore Summer Program</td>
<td>40</td>
</tr>
<tr>
<td>Exchange Programs</td>
<td>29</td>
</tr>
<tr>
<td>Non-Georgia Tech Programs</td>
<td>28</td>
</tr>
<tr>
<td>Architecture Senior Year in Paris</td>
<td>27</td>
</tr>
<tr>
<td>Summer Study in Italy – Art &amp; Architecture</td>
<td>27</td>
</tr>
<tr>
<td>Costa Rica Summer Program</td>
<td>25</td>
</tr>
<tr>
<td>Brussels Summer Program</td>
<td>23</td>
</tr>
<tr>
<td>Cuba Program</td>
<td>20</td>
</tr>
<tr>
<td>Political Economy of China</td>
<td>20</td>
</tr>
<tr>
<td>Aerospace Engineering in Russia</td>
<td>15</td>
</tr>
<tr>
<td>Modern Architecture and the Modern City</td>
<td>12</td>
</tr>
<tr>
<td>Field Work in Animal Behavior</td>
<td>12</td>
</tr>
<tr>
<td>Chemical Engineering in London</td>
<td>10</td>
</tr>
<tr>
<td>Work Abroad/International Coop</td>
<td>10</td>
</tr>
<tr>
<td>International Architectural Exchange</td>
<td>7</td>
</tr>
<tr>
<td>International Academic Projects</td>
<td>6</td>
</tr>
<tr>
<td>Argentina Summer Program</td>
<td>n/a</td>
</tr>
</tbody>
</table>

*Total: 766*

**Source:** 2002 Georgia Tech Fact Book
degree programs

Paris Program
- Ecole d’Architecture Paris La Villette
- Senior Year
- L’Atelier Franco-Americain

The Logistics Institute – Asia Pacific
- National University of Singapore
- Dual Master of Science (NUS & GT)
Georgia Tech
Lorraine
what is Georgia Tech Lorraine?

French non-profit corporation created in 1989

Promotes academic, research, and economic development in Georgia, Lorraine, Europe, and USA

“The European Platform of Georgia Tech”
where is GT Lorraine?

Lorraine Region

- 23,500 sq. km, pop. 2,300,000
- 4 Departments
  - Meurthe et Moselle, Meuse, Moselle, and Vosges
- Main Cities: Metz, Nancy
- Sistership Agreement with State of Georgia, USA
R&D in Lorraine

Technopôles
- Metz 2000 (infor./comm. technologies)
- Nancy-Brabois (life sciences, bioengineering)

Universities
- Supélec (electrical & computer engineering)
- ENSAM (mechanical & industrial engineering)
- INPL (broad range of engineering programs)
- Université de Metz
- Université de Nancy

Research Organizations
- CNRS (optical communications systems)
- INRIA (comp. engineering, oper. research)
- INSERM (life sciences)
GTL facilities

- 50,000 square feet academic and research facility located on Technopôle Metz 2000
- Student living centers at Supélec & ENSAM (also at Technopôle)
- Four furnished apartments for faculty and families
key permanent faculty
and staff

“A growing number of students realize that an engineering career is global and that they need to be properly prepared. As a result, we have had students who were admitted to MIT and Stanford who chose to go to Georgia Tech Lorraine.”

—school president
Hans B. Puttgen

• Dr. Hans Puttgen
• Dr. Francois Malassenet
• Dr. Robert Mahan
• Dr. Bertrand Boussert
• Dr. William Rhodes
• Ms. Marie-Pierre Delaleux
• Ms. Josyane Roschitz
• Ms. Christine Cezard
• M. Jacques Hanet
visiting faculty

<table>
<thead>
<tr>
<th>Per Term</th>
<th>Typically, 4-6 Georgia Tech (Atlanta) faculty in residence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live</td>
<td>60 Georgia Tech faculty and their families have been in residence</td>
</tr>
<tr>
<td>Virtual</td>
<td>50 Georgia Tech faculty have taught courses via distance learning</td>
</tr>
</tbody>
</table>
main activities, ECE & ME

1. Graduate Programs
2. Undergraduate Summer Programs*
3. Sponsored Academic Research
4. GTL-CNRS Telecom Laboratory
5. Local Economic Development

*Expanding to the academic year, Fall 2003
academic programs

1 Master of Science (30 SCH, with or without thesis) & Doctor of Philosophy
   Electrical and Computer Engineering
   Mechanical Engineering

2 Double Degrees
   M.S. & Diplôme (ECE, ME)
   Ph.D. & Doctorat (ECE)

3 Undergraduate Program
   Architecture, ECE, International Affairs, Management, ME
master’s double-degree program

Fall
Ecole Partenaire
GT (Atlanta)

Spring
GT Lorraine
Internship

Summer
MS (ECE,M E) & Diplôme

Fall
Ecole Partenaire
GT (Atlanta)

4 Years of University Studies

Georgia Institute of Technology
academic partners

Supélec (Metz)
Diplôme de Spécialisation en Traitement and Transmission de l’Information

Ecole des Mines de Nantes
Diplôme de Spécialisation en Sécurité de Fonctionnement

Institut National Polytechnique de Lorraine (Nancy)**
Master de l’INPL

Institut National Polytechnique de Toulouse
Diplôme d’Ingénieur de Section Spéciale

Ecole Nationale Supérieure d’Electricité et de ses Applications (Paris)
Diplôme de Spécialisation ENSEA

Université de Technologie de Compiègne**
Diplôme d’Etudes Approfondies UTC

Ecole Nationale d’Arts et Métiers (Metz, Paris)*
Diplôme d’Ingénieur
Certificat de Projet de Fin d’Etudes

Université de Franche-Comté***
Doctorat

* Double-degree with MSME only
** Double-degree with MSME and MSECE, all others with MSECE
*** Double-degree with Ph.D. (ECE)
basic requirements

Meet each institution’s requirements
(jointly coordinated)

Meet expected language proficiency

Complete an internship
double-degree benefits

- International academic credentials
- International professional experience
- International immersion and language proficiency
employment

Broad range of industry types

Largest current employers of GTL graduates

Alstom
SAGEM
Schlumberger
Thales
master's enrollments and degrees

120 GTL students will earn their MS in 2002-03

Country of Origin

- USA: 25%
- France: 65%
- Other: 10%

Academic Year

<table>
<thead>
<tr>
<th>MS Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>97-98</td>
</tr>
<tr>
<td>98-99</td>
</tr>
<tr>
<td>99-00</td>
</tr>
<tr>
<td>00-01</td>
</tr>
<tr>
<td>01-02</td>
</tr>
<tr>
<td>02-03</td>
</tr>
</tbody>
</table>
Lorraine

Resident/Term
Tuition/Fees = $1,824
Room/Board = $2,220
Total = $4,044

Non-Resident/Term
Tuition/Fees = $2,199
Room/Board = $2,220
Total = $4,419

Atlanta

Resident/Term
Tuition/Fees = $1,974

Non-Resident/Term
Tuition/Fees = $6,663
undergraduate program

Began summer 1998; expanding to fall 2003

Georgia Tech courses – e.g., Summer 2003

Civil Engineering – Statics, Dynamics, Strength of Materials
Architecture – Art History
Electrical/Computer Engineering – Circuits, Signals, Design
Economics – Microeconomics, Global Institutions, Entrepreneurial Firms
Modern Language – French
History/Technology – Technology and Society, History of Space
Industrial Engineering – Probability, Statistics, Optimization
Mechanical Engineering – Thermodynamics, Machine Design, Engines
Management – Marketing

Cultural and recreational activities
undergraduate enrollments

76% are engineering students

Undergraduate Majors

<table>
<thead>
<tr>
<th>Major</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE</td>
<td>22%</td>
</tr>
<tr>
<td>CS</td>
<td>14%</td>
</tr>
<tr>
<td>ISyE</td>
<td>14%</td>
</tr>
<tr>
<td>Mgt</td>
<td>9%</td>
</tr>
<tr>
<td>CmpE</td>
<td>4%</td>
</tr>
<tr>
<td>BME</td>
<td>4%</td>
</tr>
<tr>
<td>Other</td>
<td>11%</td>
</tr>
</tbody>
</table>

Undergraduate Enrollment

<table>
<thead>
<tr>
<th>Year</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>99</td>
<td>45</td>
</tr>
<tr>
<td>00</td>
<td>65</td>
</tr>
<tr>
<td>01</td>
<td>120</td>
</tr>
<tr>
<td>02</td>
<td>110</td>
</tr>
<tr>
<td>03</td>
<td>160</td>
</tr>
</tbody>
</table>

Graph showing undergraduate enrollment over summer 99 to 03.
Lorraine
Resident/Term = $4,745
Non-Resident/Term = $4,995

Atlanta
Resident/Term = $4,501
Non-Resident/Term = $9,767

Lorraine: Resident Tuition/Fees, $1,395; Non-Resident Tuition/Fees, $1,645; Room/Board, $3,150 (estimated), GTL Application Fee, $200. Atlanta: Resident Tuition/Fees, $1,601; Non-Resident Tuition/Fees, $6,867; Room/Board, $2,900 (estimated).
Future Plans
Georgia Tech’s strategic goal is to have 50% of its (undergraduate) students graduate with an international experience.

GTL’s current focus is to have 20% of Georgia Tech BS & MS students graduate having participated in GTL programs.
three challenges

Are students interested?
Will employers hire them?
Are the goals realistic?
are students interested?

Survey of one-half GT students enrolled in non-required, foreign language courses (729 Respondents)

Serious Interest in Internship Abroad 68%

Language Course

- Spanish 24%
- German 24%
- Japanese 23%
- French 21%
- Chinese 6%
- Korean 2%
- No 32%

Georgia Institute of Technology
will employers hire them?

**Recent corporate recruiters**
- Alstom
- Exxon Mobil
- GE
- Michelin
- Rolls Royce
- SAGEM
- Schlumberger
- Shell
- Siemens
- Thales
- Toyota
- ...

**Recent assignments of graduates**
- Argentina
- Bahamas
- Belgium
- Brazil
- Chile
- France
- India
- Italy
- Japan
- Mexico
- South Korea
- Switzerland
- Thailand
- ...

[Georgia Institute of Technology]
can we reach 50%?
can we reach 20% for GTL?

Expand the undergraduate program

Expand the double-degree program

Create a BS/Double-Degree program
## Assumptions

- No BS increase beyond normal growth
- Some increase in MS beyond normal growth

### Basically, change the participation mix

**Georgia Institute of Technology**
expand undergraduate program

Better marketing
- Current students
- New students

More course offerings
- On-site
- Distance learning
expand double-degree program

Better marketing
Expand partner schools
Germany
Connect to other GT campuses
create BS/Double-Degree

Encourage more U.S. students
Bring parity in participation
Attract very best undergraduates

Second degree in international
GT BS & MS Enrollment

9.8% of GT BS & MS graduates

19.9%

GT Lorraine
Thank You!

www.prism-magazine.org/mar03/export.htm

www.georgiatech-metz.fr

www.gatech.edu