


# The Engineer of 2020— Visions of Engineering in the New Century



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Ivan Allen College of Liberal Arts  
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# Outline of Points to be Presented

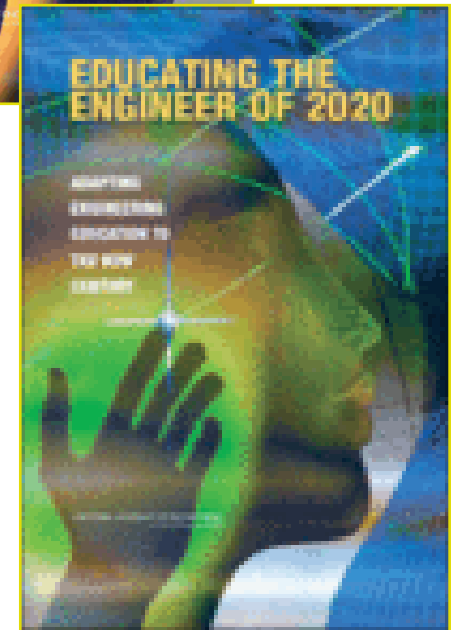
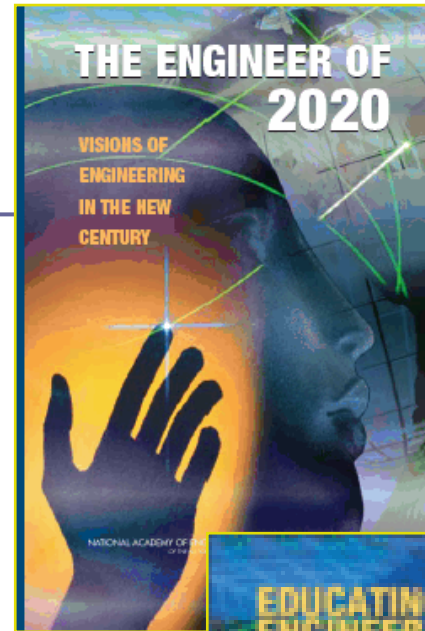
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- Connections with plenary address by Wayne Clough, President of Georgia Tech (GT)
- Overlap of Engineer of 2020 with ABET Criteria
- Partnership with colleges of liberal arts as a mechanism to educate the Engineer of 2020
- Ivan Allen College of Liberal Arts at GT
- Special emphasis on policy and internationalization
- Broaden skills of graduates

# The process

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- Phase I: Imagine the future and the challenges it will present to engineering: Woods Hole Workshop
- Phase II: Consider how engineering education should prepare for that future: Washington DC Summit



# Social, global and professional context of engineering practice

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- ❑ Population is more diverse.
- ❑ Technological change becomes even more rapid.
- ❑ Social, cultural, political forces will shape and affect the success of technological innovation.
- ❑ Consumers will demand higher quality, customization.
- ❑ Growing imperative for environmental sustainability.
- ❑ Increasing focus on assessing and managing risk with view to security, privacy, and safety.

# Educating a new breed of engineer

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- ❑ Strong analytical skills
- ❑ Practical ingenuity, creativity; an innovator
- ❑ Understanding of the larger social context of technology
- ❑ Global perspective
- ❑ High ethical standards, professionalism
- ❑ Dynamic, agile, resilient, flexible
- ❑ Lifelong learner
- ❑ Adaptive leader



# Conclusions

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- ❑ We may have only one chance to achieve our aspirations; that time may be now.
- ❑ The momentum generated by the Engineer of 2020 Project should be used to advantage.
- ❑ Strategically engage those outside of engineering who are needed to help in our cause.
- ❑ Success is tied to innovation and marketing.
- ❑ Think engineer/scientist, not “specialty name here” engineer.
- ❑ The future of engineering lies in the balance; engineering education needs to lead the charge to a time of new energy and opportunity.

# ABET Criterion 3. Program Outcomes and Assessment

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Engineering programs must demonstrate that their graduates have:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs

# ABET Criterion 3. continued

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- (d) *An ability to function on multi-disciplinary teams***
- (e) *An ability to identify, formulate, and solve engineering problems***
- (f) *An understanding of professional and ethical responsibility***
- (g) *An ability to communicate effectively***
- (h) *The broad education necessary to understand the impact of engineering solutions in a global and societal context***

# ABET Criterion 3 Continued.

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- (i) ***A recognition of the need for, and an ability to engage in lifelong learning***
- (j) ***A knowledge of contemporary issues***
- (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

# Ivan Allen College of Liberal Arts

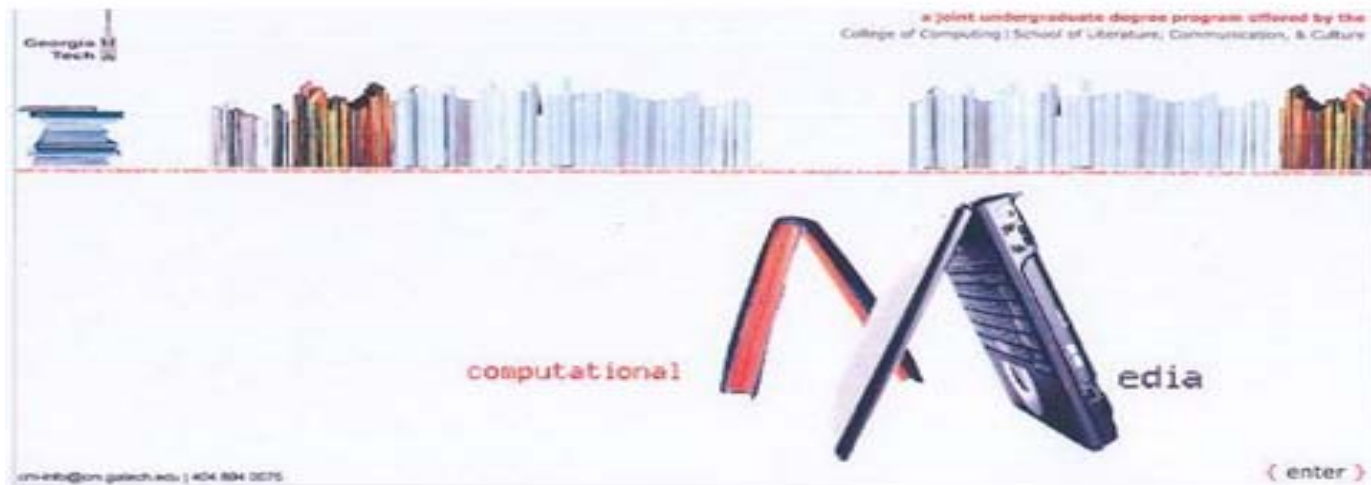
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- School of Literature, Communication, and Culture
- School of History, Technology, and Society
- School of Economics
- School of Public Policy
- Sam Nunn School of International Affairs
- School of Modern Languages
- Army, Navy, Air Force ROTC Departments

# School of Literature, Communication and Culture

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- Joint undergraduate degree with Computing



# School of Public Policy

## Why study *Public Policy* at GA Tech?

For students seeking careers as problem-solvers in public service, law, and the private sector, the BS in Public Policy provides:

### **Governing and Managing Skills:**

leadership, ethical, organizational, and political skills, project planning and management

### **Thinking Skills:**

critical thinking and logic, policy arguments, knowledge integration, strategic planning

### **Communications Skills:**

oral, written, electronic

### **Analysis and Evaluation Skills:**

problem definition, risk management, evaluation methods

### **Research Skills:**

hypothesis formulation, data collection, qualitative and statistical techniques

### **In-service Training:**

internships, undergraduate research projects, study abroad

### **Specialization:**

in-depth knowledge about the design and operation of complex systems, especially in science and technology fields

## *Internships*

Recent examples of internships obtained by BSPP students include:

Georgia General Assembly  
Former Chief Justice Vernon Riffequest  
Consulate of Israel  
Federal Deposit Insurance Corporation  
US Environmental Protection Agency  
Museum for environmental policy  
Green Trade and Investment Office  
Lippincott (top workers compensation, public affairs)  
Dear Air Campaign  
Georgia Department of Economic Development

## *Employment*

Examples of first jobs after graduating from GA Tech with a BS in Public Policy:

Government relations expert for a business corporation  
Legislative advisor at a state capital  
Grant writer for a grassroots advocacy organization  
Research analyst for K-12 education projects  
Program officer for state rural development councils  
Policy manager for a state legislature  
Political director for a gubernatorial campaign  
Flight officer training, US Navy  
Research fellow in biomedical ethics  
Staff assistant to a member of Congress

## *Education*

Many BSPP students continue their education in such areas as:

Law (e.g., Stanford, Berkeley, Emory, Syracuse)  
Public Policy Masters, Georgia Tech  
Statistics (Columbia)  
Public Health (Emory)  
City and Regional Planning (UNC at North Carolina, Cornell)

# Minors in Public Policy

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## *School of Public Policy*



### *Undergraduate Studies in Public Policy*



#### *Policy*

We offer a framework of courses in public policy, analytical process and techniques, and a two-year Government Leadership and Leaders' Honor.



#### *Law*

We offer courses and certificates in law, ethics and leadership. This is Georgia Tech's unique program.



#### *Philosophy*

We offer courses and certificates in philosophy, ethics and leadership.



# Georgia Tech's International Plan

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## ■ Goals

- Graduates who can converse and write in a second language
- Integrate into foreign lifestyles and work environments
- Have knowledge of socio-economic processes operating on a global scale
- Communicate with confidence

## ■ Requirements

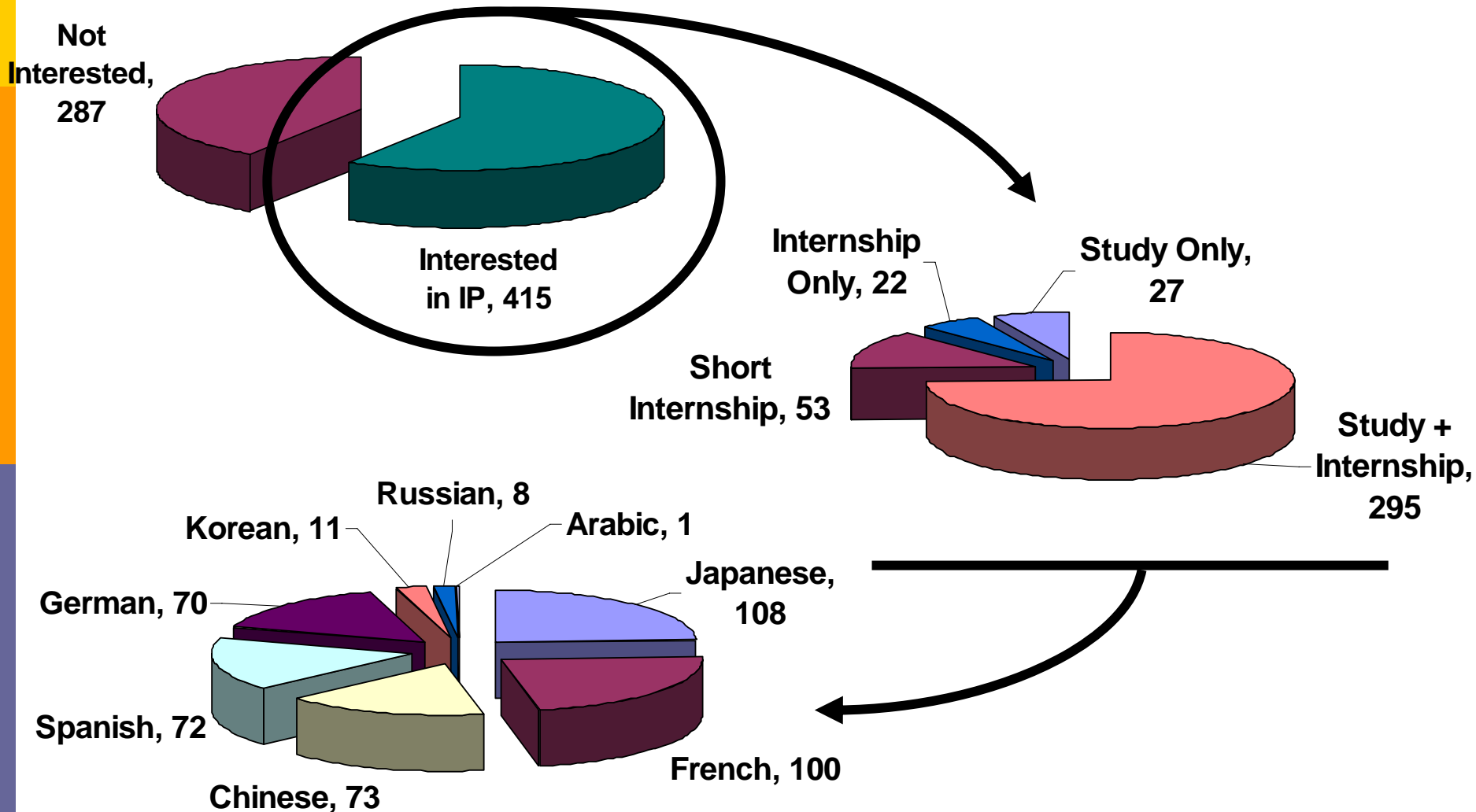
- Two terms of residential foreign experience
  - One must be a semester of academic study
- Core global or comparative international studies
- Achieve Intermediate High proficiency in a foreign language
- Capstone course

# How the School of International Affairs Manages the Plan

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- ❑ 3 existing Study Abroad programs that meet International Plan requirements
- ❑ New Study Abroad/Internship program with Monterrey Tec in Mexico effective summer 2007
- ❑ Developing relationships with institutions in Korea, Germany, and India that will provide additional options for overseas experiences
- ❑ Dedicated full-time advisor to work with faculty and advise students on requirements and applicable international experiences for “liberal arts” majors

# International Plan (IP) Interest (Fall 2005)



# Internships—Modern Languages

- Georgia Tech-TU Munich-Siemens (27)

- JETRO Internships to Japan (19)

- And (19): Brazil, China, Cost Rica, France, Mexico, Taiwan

- Alcoa, UPS, BMW, Siemens, Lufthansa, Plasticos Modernos, Bosch, ZF Group, Toshiba, Sanyo, NTT, Yokohama, Yamatake, Mouse, Inc., JCD, Asahi Glass, CDL, AIDA, Godo Sushei, EBS

First IAC Intern to Japan: Joseph Huntemann

Yokohama Rubber

Industrial Overseas Sales Dept.



**Doug Niggley (AE): TU Munich then Lufthansa Technik Hamburg**



**Nick Karnezos (ME): LBAT-TUM-Siemens**



**MacField Young (ME): TU Munich, then internships with Siemens in Germany and Bosch in Brazil**

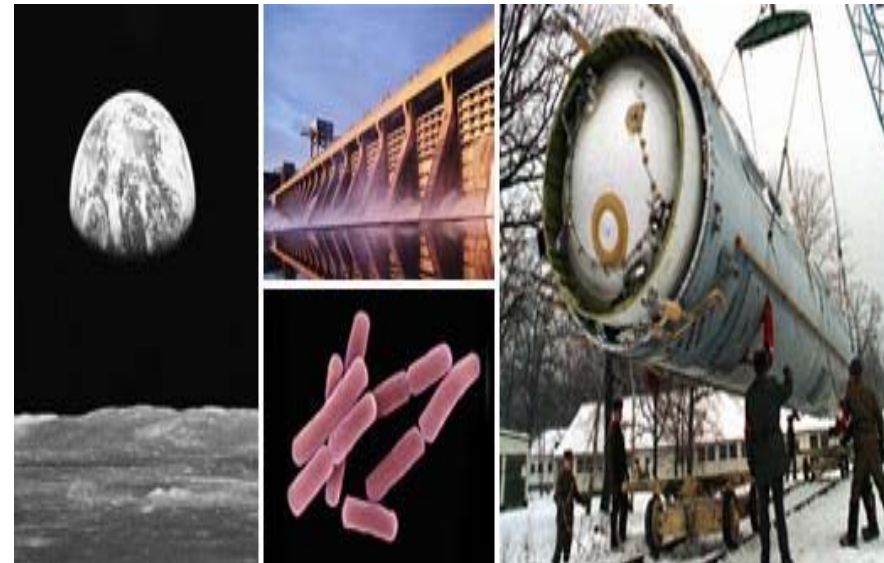


**Lawrence Tse (CS) completes LBAT and joins Sanyo Electric Co. in Japan for 6 month internship**

# Creating a New Generation of Scientists and Engineers to Inform International Security Policy

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- ❑ Awards totaling \$3.1 million from the MacArthur Foundation
- ❑ Meeting a critical national and international need for expertise with peer institutions
- ❑ Creating a interdisciplinary community of researchers at Georgia Tech
- ❑ Engaging students and interested citizens
- ❑ Programs: seminar, research, outreach



# What do graduates need to succeed?

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**Paul Camuti**

President & CEO

Siemens Corporate Research  
at the International Engineering  
Colloquium at Georgia Tech

Nov. 11, 2005

- Good communication skills, including multiple languages
- The ability to work in teams
- Cross-cultural sensitivity and knowledge; social awareness
- Capacity to handle complex systems
- Business acumen and sense of entrepreneurship

**Bottom line — Graduates must be prepared to work in a fast-paced, multi-faceted global environment.**