The Dual-Degree Engineering Programs

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Summary

- What is a dual-degree engineering program?
- How does it work?
- What are its advantages?
- What are its disadvantages?
- Who should join such a program?
- Who is offering such a program?
- The dual-degree program at Stockton
What is a dual-degree engineering program?

A Bachelor degree
From
a liberal arts college
in
Math or Science

A Bachelor of Science
degree From
an Engineering School
In
an engineering field

Typical Choices:
Degrees at liberal arts colleges: B.S. or B.A. in Math, Physics or Chemistry
Degrees at engineering schools: B.S. in most engineering fields
How does it work?

I- First three years at liberal arts college

<table>
<thead>
<tr>
<th>Math</th>
<th>Physics</th>
<th>Chemistry</th>
<th>Program</th>
<th>Liberal Arts</th>
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<tbody>
<tr>
<td>Calc I</td>
<td>Phys I</td>
<td>Chem I</td>
<td>Add’l department or program courses</td>
<td>English History Arts Social Sc.</td>
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<td>Calc II</td>
<td>Phys II</td>
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<td>Calc III</td>
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<td>Diff. Eqns</td>
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Basic engineering courses (may not be available in some colleges)
Statics, Dynamics, Engineering Graphics and CAD, Mechanics of Materials and/or Electrical Circuits

II- Fourth and Fifth years at the engineering school

Junior and senior classes in the engineering field
How are both degrees completed?

• General Education requirements for liberal arts college are greater than engineering school.

• Most of the physics, math, and chemistry courses fit both degrees as core or elective courses.

• The additional departmental or program courses at the liberal arts college fit the Technical Elective category at the Engineering school.

• Some engineering courses transferred back to the liberal arts college as program or departmental electives.

• The liberal arts college degree is typically awarded at the end of the fourth year while the engineering degree at the end of the fifth year.
Typical Curriculum

First Year (32 credits)
Fall: Phys I, Calc I, Engineering Graphics, and a general ed course
Spring: Phys II, Calc II, Computer Programming, and a general ed course

Second Year (32 credits)
Fall: Phys III, Calc III, Chem I, and a general ed course
Spring: Statics, Differential Eqns, Chem II, and a general ed course

Third Year (32 credits)
Fall: Dynamics, two departmental courses, and a general ed course
Spring: An engineering course, one departmental course and two general ed courses

Fourth Year (30 credits)
Junior classes at the engineering department

Fifth Year (30 credits)
Senior classes at the engineering department
Advantages of the Dual-degree Program

I- Benefits of being at a small liberal arts school

• Emphasis is on excellence in teaching
• All classes including entry level are small in size
• All classes are taught by dedicated faculty
• Strong faculty-student interaction

“Smaller classes at Stockton led to more individual attention to undergraduates which led to a better understanding of the material presented”
(one of our graduates)
II- Better preparation in math and science because of the additional requirements of the second degree in science or math.

III- Better communication skills because of the expanded liberal arts requirements and strong emphasis on reading, writing and reasoning.

IV- Having adequate time to decide about an engineering field.

V- Guaranteed admission to the engineering school if terms of program are met.
VI- Marketability (two degrees)

**Job Outlook for 2004-2014:**

- Engineers: an increase of 9 to 17%
- Physicists: an increase of 0 to 8%
- Chemists: an increase of 0 to 14%
- Mathematicians: some decline

What do our graduates say about marketability?

“Just to let you know, the dual-degree program paid off….Having two degrees got me a considerably higher starting salary and a signing bonus”

“I first of all want to thank you for giving me the opportunity to be a part of the dual-degree program, it has really helped my resume”

“Thank you for all your help with the dual-degree program. I think it was the best road that I took”

“having two degree impressed the interviewers and gave an advantage over those with one degree”

“…..recruiters at job fairs did find it very impressive and my resume was supposedly put into a lot of databases”
Disadvantages of the dual-degree program

- An extra year
- Limited choices of schools
- Desire to move more engineering courses to sophomore and freshman years
- Less flexibility to incorporate co-op programs during academic year
- Moving from one school to another
Who should consider joining a dual-degree engineering program?

I- Students who can benefit from a small liberal arts school in the first three years.

- Students who are interested in early research activities and strong interaction with faculty
- Students who are not yet fully independent and are in need of nurturing environments
- Students who enjoy small school environments and may feel lost moving from HS to a big university

II- Students who are considering multiple career choices or looking for an extra edge in future employment

III- Students who are interested in engineering but are not sure about a field yet
Where are these programs?

- UC Santa Cruz with UC Berkley
- St Mary College with University of Notre Dame
- Indiana University South Bend with Purdue University
- Schools having dual-degree program with Virginia Tech:
  
  Bridegewater College, Elon College, Longwood University, Radford University, Roanoke College, University of Richmond, Sweetbriar College
129 liberal arts colleges and university have dual-degree engineering programs with Washington University in St. Louis

Examples:
Bard College (NY)
Berea College (KY)
Clark University (MA)
Cornell College (IA)
Davidson College (NC)
Drake University (IA)
Drew University (NJ)
Gettysburg College (PA)
Hawaii Pacific University (HI)
Loyola University of Chicago (IL)
Oberlin College (OH)
Pomona College (CA)
Ursinus College (PA)
Washington & Jefferson College (PA)
William and Mary, College of (VA)
Wittenberg University (OH)
27 liberal arts schools have dual-degree programs with Georgia Tech
Examples:

Agnes Scott College
Alabama A&M University
Albany State University
Columbus State University
Emory University
Fort Valley State University
Furman University
Georgia College & State University
Georgia Southern University
Georgia Southwestern State University
Jackson State University
Morehouse College
North Carolina Central University
Savannah State University
Spelman College
State University of West Georgia
Wesleyan College
Xavier University
The dual-degree engineering program at Stockton

- Offered jointly by Stockton, Rutgers and NJIT
- Basic engineering courses are offered at Stockton
- Students in the program are assigned an engineering faculty at Stockton as their advisor
- Students are transferred at end of 3rd year to the school of their choice; Rutgers or NJIT
- The transfer is automatic but a “B” average in science and math is required
- Students in the program have excellent success record at Rutgers and NJIT
What is New at the Richard Stockton College of NJ?

**A Dual-degree Computational Science Program**

- A bachelor at the end of the 4th year and a Master at the end of the 5th year. Both are awarded by Stockton.
- First undergraduate program in computational science in the state of NJ.
- First dual-degree program in computational science in the US.
- For more info pick up a brochure and check the poster next to the promotion table.