

IDEAS: Integrated Degree in Engineering, Arts and Sciences

IDEAS: INTEGRATED DEGREE IN ENGINEERING, ARTS AND SCIENCES

IDEAS is a four-year honors program resulting in an integrated Bachelor of Science (BS) Degree—jointly administered by the College of Arts and Sciences and the P.C. Rossin College of Engineering and Applied Science.

Interdisciplinary education in the arts and sciences and engineering is of significant value to students who will pursue a wide variety of careers. The complex challenges and problems confronting us in the 21st century dramatically underscore the importance of liberally educated and technologically sophisticated individuals whose habits of thought are thoroughly and comfortably interdisciplinary. Moreover, Lehigh is one of a small number of universities with the resources necessary to provide such an education. The students in this program will benefit from the integrated strategic leveraging of strengths across college boundaries.

This program cultivates a new breed of cross-disciplinary innovators. It provides an education that produces students well-versed in dual focus areas, one in engineering and one in the arts, humanities, social sciences, mathematics or natural sciences. This educational environment also cultivates a multitude of thinking styles. It is renaissance thinking for the technological era.

Entry Requirements

- 1. Admitted students who have expressed an interest when applying will be considered for the IDEAS program. Only a limited number of students will be accepted. Students are invited to join this honors program by invitation.
- 2. To remain in the IDEAS program students must maintain a 3.25 GPA. At the end of the first year, a student with a GPA below 3.25 is given two semesters to achieve a GPA of 3.25; otherwise, the student will be asked to transfer to a regular degree program.
- 3. Students may transfer into the IDEAS program at the end of their first semester or year if space becomes available. A formal application to the program must be filed and approval from the co-directors must be obtained.
- 4. Students who are interested in the IDEAS program should indicate that interest when applying.

The IDEAS program is designed so that students who transfer out of the program at the completion of the first year will still be able to complete an arts and sciences or engineering degree in four years. The four-year IDEAS program does not lead to an ABET accredited engineering degree. It is possible for students to complete a BS degree in IDEAS and an ABET accredited BS engineering degree (dual degrees) in one or two additional semesters.

PROGRAM COMPONENTS

The IDEAS degree requires a minimum of 136 credits in the program components shown below:

IDEAS Seminars

IDEA 001	IDEAS Seminar I	2
IDEA 002	IDEAS Seminar II	2
IDEA 101	IDEAS Seminar III	1
IDEA 201	IDEAS Seminar IV	1
IDEA 301	IDEAS Seminar V	1

First-Year Writing <sup>1</sup>

WRT 001	Academic and Analytical Writing	3
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Math/Science core <sup>2</sup>

MATH 021	Calculus I	4
MATH 022	Calculus II	4
MATH 023	Calculus III	4
MATH 205	Linear Methods	3
CHM 030	Introduction to Chemical Principles	4
PHY 011 & PHY 012	Introductory Physics I and Introductory Physics Laboratory I	5

Select courses from two of the following disciplines for a total of eight credits: 8

BIOS 041 & BIOS 042	Introduction to Cellular and Molecular Biology and Introduction to Cellular and Molecular Biology Laboratory
CHM 031	Chemical Equilibria in Aqueous Systems
CHM 110 & CHM 111	Organic Chemistry I and Organic Chemistry Laboratory I
EES gateway courses	
MATH 231 or ISE 111 or BIOS 130	Probability and Statistics Engineering Probability Biostatistics
PHY 021 & PHY 022 or PHY 013	Introductory Physics II and Introductory Physics Laboratory II General Physics II

Engineering concentration <sup>3</sup>

Specified by the college, including at least 16 credits of advanced coursework 32

Arts & Science concentration <sup>4</sup>

Specified by the college, including at least 16 credits of advanced coursework 32

A&S distribution requirements

Social Science	8
Humanities	8
Free Electives <sup>5</sup>	14

Total Credits 136

1

First-Year Writing: IDEAS students are required to take one semester of First-Year Writing with WRT 001. Students may fulfill this requirement through appropriate Advanced Placement or International Baccalaureate scores, or approved transfer credit.

2

The math/science core consists of 24 credits of required courses (see table above) plus 8 additional credits drawn from two of the following disciplinary areas: biological sciences, chemistry, EES, physics, math. All students in the IDEAS program will automatically fulfill the CAS math and natural science distribution requirements, as well as most engineering math/science requirements.

3

The engineering concentration consists of a selection of engineering courses drawn from one of the traditional engineering disciplines or from an approved interdisciplinary engineering concentration. The concentration is drawn solely from courses offered within the college of engineering, and requires at least 16 credits of advanced coursework (200-level or above). ENGR 160 or ENGR 200 may not be counted towards the engineering concentration.

4

The arts and sciences concentration consists of a selection of courses drawn either from one of the traditional CAS disciplines or from an approved interdisciplinary concentration. The concentration is drawn solely from courses offered within the college of arts and sciences, and requires at least 16 credits of advanced coursework (200-level or above).

5

Free electives can be taken within any college or outside of the colleges (e.g. CINC courses) and may contribute to a minor program. ENGR 160 or ENGR 200 may be counted as free electives. CINC courses may count for up to six credits towards the degree.

Academic Advising

- 1. The program is jointly administered by co-directors from the College of Arts and Sciences and the P.C. Rossin College of

Engineering and Applied Science. They, after the first year, become the secondary academic advisors for all IDEAS students.

2. Primary faculty advisors from appropriate disciplines provide quality curriculum advising in each of the student's chosen concentrations. Careful advising is required because of the greater flexibility of IDEAS.
3. Students who wish to earn an accredited engineering degree in one additional year should inform their advisors.

For general information visit the IDEAS web site at: [www.lehigh.edu/IDEAS](http://www.lehigh.edu/ideas/) (<http://www.lehigh.edu/ideas/>)

### **Courses**

#### **IDEA 001 IDEAS Seminar I 2 Credits**

The first year IDEAS core courses will emphasize intensive faculty mentoring within a small seminar environment where students develop, write, and present their individual interest areas and select their concentrations.

#### **IDEA 002 IDEAS Seminar II 2 Credits**

The first year IDEAS core courses will emphasize intensive faculty mentoring within a small seminar environment where students develop, write, and present their individual interest areas and select their concentrations.

#### **IDEA 101 IDEAS Seminar III 1 Credit**

A continuation of IDEAS 01 & IDEA 012 where interest areas are integrated into themes as individual concentrations are pursued.

#### **IDEA 201 IDEAS Seminar IV 1 Credit**

The junior year courses have students working on team-based projects and preparing for the senior year thesis work.

#### **IDEA 300 Apprentice Teaching 1-4 Credits**

**Repeat Status:** Course may be repeated.

#### **IDEA 301 IDEAS Seminar V 1 Credit**

The Senior-year IDEAS Seminar has students working on team-based projects and focuses on thesis work.