

IDEAS: Integrated Degree in Engineering, Arts and Sciences

IDEAS: INTEGRATED DEGREE IN ENGINEERING, ARTS AND SCIENCES

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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

- 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.
- 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.
- 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.
- 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 core ¹

IDEA 011	IDEAS Seminar I	2
IDEA 012	IDEAS Seminar II	2
IDEA 111	IDEAS Seminar III	2
IDEA 112	IDEAS Seminar IV	2
IDEA 150	IDEAS Seminar V	1
IDEA 151	IDEAS Seminar VI	1
IDEA 250	IDEAS Seminar VII	1
IDEA 251	IDEAS Seminar VIII	1

Math/Science core ²

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 three of the following:		12
BIOS 041 & BIOS 042	Introduction to Cellular and Molecular Biology and Introduction to Cellular and Molecular Biology Laboratory	
CHM 110 & CHM 111	Organic Chemistry I and Organic Chemistry Laboratory I	4
EES gateway courses		
PHY 021 & PHY 022	Introductory Physics II and Introductory Physics Laboratory II	
MATH 231	Probability and Statistics	
Engineering concentration ³		
Specified by the college		36
Arts & Science concentration ⁴		
Specified by the college		36
A&S distribution requirements ⁵		
As defined by the college		16
Total Credits		140

1

The writing intensive IDEAS core courses consist of a first year course in which students develop their interests, two stepping-stone courses in the middle years where their interests are integrated with others and a senior thesis course in the fourth year.

2

The math/science core consists of 24 credits of required courses (see table above) plus 12 elective credits drawn from: BIOS 041, BIOS 042; CHM 110, CHM 111; EES gateway courses; PHY 021, PHY 022; MATH 231. All students in the IDEAS program will automatically fulfill the CAS math and natural science distribution requirements.

3

The engineering concentration consists of a selection of engineering courses drawn either from one of the traditional engineering disciplines or from an approved interdisciplinary engineering program. Some engineering programs are designed to coordinate with specific arts and sciences themes.

4

The arts and sciences concentration is either a curriculum specific one or an interdisciplinary one such as Science, Technology and Society (STS).

5

The elective block may be used for a minor, another program, or to fulfill CAS distribution requirements.

Curriculum Details

Additional details on the main curricular components of the program include:

- IDEAS Core Courses: One each semester.
 - These courses replace ENGR 005, ENGL 001 & ENGL 002, the CAS college seminar, and the CAS junior year writing intensive requirement. All IDEAS core courses are writing intensive.
 - IDEA 011 and IDEA 012: 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 111 and IDEA 112: a continuation of IDEA 011 & IDEA 112 where interest areas are integrated into themes as individual concentrations are pursued.

2 IDEAS: Integrated Degree in Engineering, Arts and Sciences

- d. IDEA 150 and IDEA 151: the junior year courses have students working on team-based projects and preparing for the senior year thesis work.
 - e. IDEA 250 and IDEA 251: the senior year honors thesis courses.
2. Math/Science Core: All students are required to fulfill the 36 credit math/science requirement, regardless of their choice of concentrations.
 3. Engineering Majors: Engineering majors are divided into two different categories:
 - a. Interdisciplinary Theme: an approved interdisciplinary theme in engineering that can be coordinated with a liberal arts concentration.
 - b. Engineering Discipline: a defined engineering discipline, e.g., mechanical engineering. Students will follow a concentration in the curriculum defined by the chosen area.
 4. Arts and Sciences Majors: A&S majors are divided into two different categories:
 - a. Interdisciplinary Theme: an approved interdisciplinary theme (e.g. STS) in arts and sciences that can be coordinated with an engineering concentration.
 - b. Liberal Arts Discipline: a defined liberal arts discipline, e.g., English. Students will follow the curriculum defined by the chosen concentration.

A minimum of 36 credits is required in the liberal arts concentration. If students choose a concentration that requires fewer than 36 credits, in addition to those taken as part of the math/science core, the additional credits must be selected in the CAS.

Students may select mathematics or science as the liberal arts discipline. However, the humanities and social science distribution requirement (8 credits of humanities and 8 credits of social science) must be satisfied using the 16 credit elective core which is also accepted for distribution in the RCEAS.
 5. Interdisciplinary Theme: an approved interdisciplinary theme (e.g. STS) in arts and sciences that can be coordinated with an engineering concentration.
 6. Liberal Arts Discipline: a defined liberal arts discipline, e.g., English. Students will follow the curriculum defined by the chosen concentration.
 - a. A minimum of 36 credits is required in the liberal arts concentration. If students choose a concentration that requires fewer than 36 credits, in addition to those taken as part of the math/science core, the additional credits must be selected in the CAS.
 - b. Students may select mathematics or science as the liberal arts discipline. However, the humanities and social science distribution requirement (8 credits of humanities and 8 credits of social science) must be satisfied using the 16 credit elective core which is also accepted for distribution in the RCEAS.
 7. Combining the Engineering and Liberal Arts Concentrations: You may combine your particular interests in engineering and in arts and sciences and customize your academic experience at Lehigh in one of the following ways:
 - a. by combining an Engineering Discipline with an Arts and Sciences Discipline (e.g., Electrical Engineering and International Relations)
 - b. by combining an Engineering Discipline with an Arts and Sciences Theme (e.g., Chemical Engineering and STS)
 - c. by combining an Engineering Theme with an Arts and Sciences Discipline (e.g., Product Liability and Chemistry)
 - d. or custom design your own combination between Engineering and Arts and Sciences with your advisors

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/>)

Courses

IDEA 011 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 012 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 111 IDEAS Seminar III 2 Credits

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

IDEA 112 IDEAS Seminar IV 2 Credits

A continuation of IDEAS 011 & IDEA 012 where interest areas are integrated into themes as individual concentrations are pursued.

IDEA 150 IDEAS Seminar V 1 Credit

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

IDEA 151 IDEAS Seminar VI 1 Credit

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

IDEA 250 IDEAS Seminar VII 1 Credit

The senior year honors thesis courses.

IDEA 251 IDEAS Seminar VIII 1 Credit

The senior year honors thesis courses.

IDEA 300 Apprentice Teaching 1-4 Credits

Repeat Status: Course may be repeated.