

College of Arts and Sciences

Donald E. Hall, *dean*; Diane T. Hyland, *senior associate dean*;
Cameron B. Wesson, *associate dean*; Jackie Krasas, *associate dean*; Dominic Packer, *associate dean*.

The College of Arts and Sciences is the heart of Lehigh University, offering a wide variety of academic majors, minors, and interdisciplinary programs, while also providing essential liberal arts access to all Lehigh students. Arts and Sciences faculty are engaged as active scholars, are highly accessible, and are committed to the teaching mission of our undergraduate programs. A hallmark of our college is the faculty's ability to engage students interactively and experientially in teaching, research, and scholarship.

Students in the College develop new habits of mind that have become the hallmarks of a liberal arts education, testing assumptions, seeking evidence to support their understanding of the world, and probing the unknown with curiosity. These habits prepare our graduates to thrive in an uncertain world. Through a combination of college-wide distribution requirements and major field requirements in their chosen discipline, Lehigh Arts and Sciences students investigate and acquire knowledge of human cultures and the physical and natural world by studying arts, humanities, mathematics, natural sciences, and social sciences.

Studying broadly in these areas while pursuing a deeper concentration in a major field helps develop the intellectual curiosity and requisite skills necessary to creating lifelong learning habits as our graduates confront constant changes in society, technology, as well as their careers and personal lives.

The College of Arts and Sciences offers several curricular options:

- A four-year arts and sciences curriculum leading to a bachelor of arts or bachelor of science degree in designated fields.
- A five-year arts-engineering curriculum leading to a bachelor's degree from the College of Arts and Sciences and a bachelor of science degree from the College of Engineering and Applied Science.
- Dual degree programs within the college and in conjunction with the other two undergraduate colleges.
- A five-year program leading to a bachelor's degree from the College of Arts and Sciences and a master's degree in Education from the College of Education. Please see below for more information.

MAJOR DEGREE PROGRAMS IN THE COLLEGE

Bachelor of Arts and Bachelor of Science Degree Programs

Two distinct bachelor-degree programs are offered by the College, the BA and the BS, each distinguished by the number of courses taken in the major field and ancillary disciplines. For the Bachelor of Arts degree a student takes a comparatively smaller number of courses to fulfill the major requirements plus a selection of courses in various fields outside the major. For the Bachelor of Science degree (offered in designated disciplines), a student takes a more extensive concentration in the major field, along with a proportionally smaller number of courses outside the major. Except for this distinction, the same basic requirements must be met for both degree programs (including the minimum number of 120 hours for graduation and the minimum grade point average in the major of 2.0). No more than six hours of military science may be applied toward either degree.

Bachelor of Arts Degree

ba degrees are offered in the following areas

ARTS

Architecture, art, art history, design, music, music composition, theatre

HUMANITIES

Asian studies, classical civilization, classics, English, modern languages and literature (Chinese, French, Francophone Studies, German, Spanish, and Hispanic Studies), philosophy, religion studies

Social Sciences

Africana studies, anthropology, cognitive science, economics, environmental studies, global studies, history, international relations,

IR/MLL joint major, IR/ECO joint major, journalism, journalism/science writing, political science, psychology, science, technology and society, sociology, sociology and anthropology, women, gender and sexuality studies

Mathematics and Natural Science

Astronomy, behavioral neuroscience, biology, chemistry, computer science, earth and environmental science, mathematics, molecular biology, physics

BA degrees in premedical science, premedical science, or preoptometry science are available to students who are admitted to certain combined degree programs (see Pre-Health Professions Programs).

Bachelor of Science Degree

BS degrees are offered in the following areas

Astrophysics, behavioral neuroscience, biochemistry, biology, chemistry, computer science, earth and environmental science, mathematics, molecular biology, pharmaceutical chemistry, physics, psychology, statistics

GENERAL PLAN OF UNDERGRADUATE STUDY

Students in the College are required to choose (usually by the end of the sophomore year) a major field and to complete a program of courses selected in consultation with the student's advisor. For most students, the credits earned for the major and those earned for college distribution requirements are not enough to meet the graduation requirement of 120 credit hours. Students normally take free elective courses in areas of interest to earn these remaining credits. Three types of courses - one in the student's area of concentration (the major-field requirements), a second set drawn from certain designated disciplines (the distribution requirements), and a third set without constraints (the free electives) - comprise the educational program of the College.

Major Field of Concentration

By majoring in a specific discipline a student establishes a foundation of knowledge and develops expertise and intellectual sophistication in their field.

The minimum number of credits for a major is 30. A student must maintain a minimum grade-point average of 2.0 in the major field, and in the entire coursework.

Standard major sequences

When a student declares a major they are assigned a major advisor from that department or program's faculty. The major advisor assists students with course selection, research opportunities, internship selection, and other areas of professional development. In all cases, the final responsibility for meeting both major and non-major requirements rests with the student.

Special interdisciplinary majors

In addition to our established major programs, specially structured interdisciplinary majors linking multiple disciplines are possible. For example, a student interested in a professional school of urban or regional planning might wish to structure a special major consisting primarily of courses in political science, environmental studies, sociology, or any other relevant disciplines.

Any student may, with the aid of faculty members chosen from the disciplines involved, devise an interdisciplinary major program to include no less than thirty credits of related course work, with at least 15 credits from advanced courses. The major advisors and the dean of the college must approve the program.

Multiple majors and Dual degrees

A student who wishes to fulfill the requirements for more than one major program has two options: a double major or a dual degree. A double major is a single BA degree with two majors. A student pursues a double major by declaring both majors. Typically, double majors can be completed in four years, but sequencing of courses and time conflicts with required courses can introduce delays. No more than three courses may be used to meet both majors' requirements.

A dual degree program is a combined BA and BS program or two BS degrees in one or more of our undergraduate colleges. The BA is offered by the College of Arts and Sciences, and the BS may be in CAS or in one of the other undergraduate colleges. A student pursues a dual degree by declaring the first program and then petitioning the Standing of Students Committee for permission to pursue the second degree program. A semester-by-semester plan and a major declaration for the second degree must accompany the petition to pursue a dual degree. The dual-degree student must satisfy major and distribution requirements for both degrees and earn a minimum of 30 additional credits beyond those required for the first degree. All of the 30 additional credits must be taken at Lehigh or in Lehigh residency programs. The requirement of 30 additional credits typically makes the dual degree program a five-year program. There is no limit on the number of overlapping courses between two degrees, but there must be at least 30 credits of stand alone coursework in each degree program. For administrative purposes, students who take two degrees or two majors must designate one as their primary major or primary degree program.

Distribution Requirements

Whatever expertise in a single discipline an undergraduate may achieve, curiosity lures most of us beyond the confines of a single chosen specialty. Furthermore, in a swiftly changing world, careers are rapidly being redefined and only a person of broad intellectual mindset can consider where their talents may be most useful to society. Many of the basic modes of thought and work in various fields are being reformulated, often producing surprising influences in the public and private spheres. To develop a satisfying professional life and be a responsible citizen of our increasingly global world, one needs exposure to the concepts and methods of a variety of disciplines.

CAS distribution requirements draw upon five primary domains of learning: arts, humanities, mathematics, natural sciences, and social sciences. The faculty believe exposure to these broad areas will help students develop a basic understanding of the various forms of knowledge generated in these fields. Specific credit hours are required in each of the following four domains: arts and humanities, mathematics, natural sciences, and social sciences.

Distribution Requirements for the B.A. and the B.S.

First-Year Seminar

One course during the first year 3-4

English Composition

Two courses during the first year 6

Mathematics¹

Chosen from designated courses in mathematics, philosophy, or computer science 3

Natural Sciences¹

Chosen from designated courses in astronomy, astrophysics, biological anthropology, biosciences, chemistry, earth and environmental sciences, physics, and neuroscience. 8

At least one science course must also include the associated laboratory.

Social Sciences^{1, 2}

Chosen from designated courses in anthropology, classics, economics, political science, history, international relations, journalism, psychology, social psychology, social relations, sociology, and STS. 8

Arts and Humanities^{1, 2}

Chosen from designated courses in architecture, art, classics, history, modern languages and literature, English, music, philosophy, religion studies, and theatre. 8

Junior Year Writing Intensive¹ 3-4

Only courses designated as "WI" in the class schedule or select independent studies may be used to fulfill this requirement.

Total Credits 39-41

¹ Students and advisors should monitor closely the progress toward completion of requirements. Courses taken to satisfy a major program may be used to satisfy distribution requirements in only one distribution area.

² CAS also offers courses in interdisciplinary programs that satisfy Arts & Humanities and Social Science distribution requirements in the following programs: Africana Studies, Asian Studies, Cognitive Science, Environmental Studies, Global Citizenship, Global Studies, HMS (Health, Medicine, & Society), Jewish Studies, Latin American and Latino Studies, and WGSS (Women, Gender, & Sexuality Studies).

Total required for graduation: 120 credits

FIRST-YEAR SEMINAR PROGRAM

During their first academic year, preferably in the fall, every student in the College of Arts and Sciences is required to enroll in a First-Year Seminar. College seminars provide an intimate and supportive environment that facilitates the transition to university life. Within the seminar students develop skills that serve as a framework for their future scholarly work – how to read closely, think critically, write clearly, learn cooperatively, speak persuasively, and solve problems creatively.

Courses in this program are an excellent way to explore a subject that may be new, or to enter more deeply into an area of previous interest. Whatever the topic, FYs emphasize reading assignments, papers, and oral presentations, while others include tests, laboratory work, or fieldwork.

JUNIOR-YEAR WRITING CERTIFICATION

The faculty of the College of Arts and Sciences value writing as an essential tool for learning. Writing well is indispensable for performing responsibly in any profession and in most areas of life. Beyond the two English courses required in the first year, students are encouraged to take courses that provide continued practice in writing. In particular, each student must complete at least one "writing-intensive" course, normally during their junior year. Some major programs require the writing-intensive course be taken in the major field, while others allow it to be chosen freely from writing-intensive courses offered by any department or program. Courses that satisfy the writing-intensive requirement may also be used to fulfill major or distribution requirements. Please note: only courses designated as "WI" in the course catalog or select independent studies may be used to fulfill this requirement. Transfer credits may not be used to meet the Writing Intensive requirement.

MINOR PROGRAMS IN THE COLLEGE

Certain departments, divisions, and programs in the College afford students an opportunity to minor in an additional field of concentration other than their major field of study.

Minors require a minimum of 15 credits, but the specific content is determined by the department, division, or program offering that minor. A minor is optional, and if successfully completed, will be shown on the university transcript in the same manner as the major field. A 2.0 minimum grade-point average is required for courses in the minor. Because of this requirement, no course in the minor program may be taken with Pass/Fail grading. No more than one course may be double-counted toward a major and a minor, and no more than one course may overlap between two minors.

Minors in the College of Arts and Sciences are available for degree candidates in other colleges within the university, with approval of their college advisor.

The following are established minors in the College of Arts and Sciences. Some minor-program descriptions are collected within departmental descriptions, or located elsewhere, as indicated by parentheses. Students in the College of Arts and Sciences may also complete a minor in Business through the Business College or an Engineering minor through the College of Engineering.

- Actuarial Science (Mathematics)
- Africana Studies
- Anthropology (Sociology and Anthropology)
- Art (Art, Architecture and Design)
- Art/Architecture History (Art, Architecture and Design)
- Asian Studies

- Astronomy
- Biology (Biological Sciences)
- British Literature (English)
- Business
- Chemistry
- Chinese (Modern Languages and Literature)
- Classical Civilization (Classical Studies)
- Classics (Classical Studies)
- Cognitive Science
- Communication (Journalism and Communication)
- Computer Science
- Design
- Earth and Environmental Sciences
- Economics
- Education (Education Minor, this section)
- Engineering
- English
- Environmental Studies
- French (Modern Languages and Literature)
- German (Modern Languages and Literature)
- Global Studies
- Graphic Communication (Art and Architecture)
- Health, Medicine and Society
- History
- International Environmental Policy
- International Relations
- Japanese
- Jewish Studies
- Journalism (Journalism and Communication)
- Latin (Classical Studies) (minor offered through Classics program)
- Latin American and Latino Studies
- Mathematics, Applied (Mathematics)
- Mathematics, Pure (Mathematics)
- Military Science
- Molecular Biology (Biological Sciences)
- Museum Studies (Art and Architecture)
- Music
- Music Industry
- Philosophy
- Physics
- Political Science
- Probability and Statistics (Mathematics)
- Psychology
- Public Administration (Political Science)
- Public Relations (Journalism and Communication)
- Religion Studies
- Russian (Modern Languages and Literature)
- Science, Technology and Society
- Science Writing (Journalism and Communication)
- Social Relations (Sociology and Anthropology)
- Sociology (Sociology and Anthropology)
- Spanish (Modern Languages and Literature)
- Studio Art (Art and Architecture)
- Sustainable Development
- Theatre
- Women, Gender, and Sexuality Studies
- Writing (English)

***For minors outside of the College of Arts & Sciences, please see below.**

OPPORTUNITIES

ECKARDT SCHOLARS PROGRAM

The Eckardt Scholars Program is a highly selective and unique honors program in the College of Arts and Sciences. The program prioritizes intellectual curiosity, independent work, and close mentoring relationships between students and faculty. Each incoming class includes approximately twenty Eckardt Scholars. These students receive unique academic privileges that provide them with great opportunities at Lehigh and beyond. Students in the program are exempt from the Arts & Sciences distribution requirements and work with their major advisor and the Eckardt Scholars Program Director to create a flexible course of study that best suits their academic interests and ambitions. Although exempt from distribution requirements, students will complete the requisite number of credits for their degrees and all correlative requirements for their majors. The program includes participation in two Eckardt Scholar Seminars and completion of an independent project (e.g., a thesis, artistic creation, or other capstone experience) during the senior year.

Participation in the Eckardt Scholars Program is restricted to only the most well-qualified students. Some students are invited to enroll when first admitted to Lehigh, while others are identified by faculty and encouraged to apply during their first few semesters. Admission to the program is decided on the basis of academic records, written statements of educational goals, and at least two faculty recommendations.

FOREIGN LANGUAGE STUDY

Students planning to pursue graduate study toward a doctorate should be aware that most graduate schools require doctoral candidates to demonstrate a reading knowledge of one or two foreign languages. Proficiency in foreign languages is advantageous for careers in law, government, journalism, commerce, industry and other fields.

INTERNSHIPS

Many departments and programs offer credit for specific internship experiences. Students should consult with their home department for information on arranging internships. The University faculty has established three important criteria that must be met by all internships: 80 hours of work are required for each credit awarded, no credit can be awarded for an internship *ex post facto*, and the student must register for the internship course during the same term that the internship work is performed. Students must pre-arrange all internship experiences with the appropriate department. Internship credits cannot be awarded for work experiences lacking a distinct, identifiable educational component. A memorandum of understanding circulated among the employer, student, and departmental internship course director helps to promote a common understanding of the educational and work objectives of the internship. Students are advised that not all work experiences advertised as "internships" warrant academic credit, even though they may be otherwise worthwhile.

***For information on the Five-Year Bachelors Plus Master's of Education and Secondary Teacher Certification please see below.**

PRE-LAW PROGRAM

In keeping with the policy of the Association of American Law Schools, the university does not have a prescribed pre-law curriculum; however, Lehigh has a strong pre-law tradition. Successful candidates for law school demonstrate skills in critical analysis, logical reasoning, and communication and have pursued rigorous coursework of significant breadth and depth. Lehigh students have attained entrance to law schools from diverse curricula in all three of the undergraduate colleges. Specifically law-related courses are offered in the College of Arts and Sciences (e.g. Constitutional Law and Politics, Civil Rights and Civil Liberties, Law and Order) and the College of Business and Economics (e.g., Introduction to Law and Legal Environment of Business).

In addition to formal academic instruction, Lehigh provides other opportunities for learning about the law and legal careers. The annual Tresolini Lecture series brings nationally recognized speakers to campus for extended interactions with faculty and students. Tresolini lecturers have included present and past U.S. and state Supreme Court justices and renowned legal scholars and practitioners. Lehigh

also provides opportunities for gaining academic credit in several off-campus programs that provide practical experience in law and public affairs.

Advising is available to prospective pre-law students on a continuous basis from first-year orientation through the law school application process in the senior year. The pre-professional advisor in the Center for Career and Professional Development coordinates these pre-law counseling services.

PRE-HEALTH PROFESSIONAL PROGRAMS

Schools of medicine, dentistry, optometry, podiatry, and veterinary medicine stress the importance of a strong liberal arts education as well as prescribed studies in the sciences. Although most pre-health students will choose a major in a pure or applied science, as long as candidates have the essential courses in biology, chemistry, physics, and mathematics, they may major in any of the three undergraduate colleges.

A health professions advisory committee, which includes the pre-professional advisor and faculty members from the sciences and social sciences, provides career and academic counseling and works closely with students from first-year orientation through the entire process of applying to professional schools. Students with an interest in the health professions are urged to consult with the pre-professional advisor in the Center for Career and Professional Development as early as possible in their academic career.

COMBINED-DEGREE PROGRAM IN MEDICINE

In cooperation with Drexel University College of Medicine, Lehigh offers an accelerated program that enables selected students to earn both the baccalaureate degree (B.A.) with a major in premedical science and the M.D. degree after seven total years of study at the two institutions. In the first three academic years at Lehigh, credit hours are earned toward the 120 credits required for the baccalaureate degree. The next four years are spent in the regular program of medical education at Drexel University College of Medicine in Philadelphia. By successfully completing their first year at the medical school, students acquire the necessary additional credit hours for the Lehigh baccalaureate degree.

During their pre-professional years at Lehigh, students are expected to make satisfactory progress in academic areas as well as in the more subtle task of personal growth in those attributes ultimately needed as a physician. Drexel University College of Medicine receives student grades and monitors student progress through feedback from Lehigh. Students are expected to attain specified grade point averages and MCAT scores. Students' undergraduate credentials are processed through the Admissions Committee of Drexel University College of Medicine before a final definitive acceptance is offered. The medical college reserves the right to withdraw an offer of acceptance on the grounds of academic or personal maturation concerns.

Application for admission to this program is made through Lehigh's Office of Admissions. Application deadline is November 15.

REQUIRED SCIENCE AND MATH COURSES

Chemistry

Select one of the following: 8

CHM 030 & CHM 031	Introduction to Chemical Principles and Chemical Equilibria in Aqueous Systems	
CHM 040 & CHM 041	Honors General Chemistry I and Honors General Chemistry II	
CHM 110 & CHM 111	Organic Chemistry I and Organic Chemistry Laboratory I	4
CHM 112 & CHM 113	Organic Chemistry II and Organic Chemistry Laboratory II	4

Biology

BIOS 041 & BIOS 042	Biology Core I: Cellular and Molecular and Biology Core I: Cellular and Molecular Lab	4
BIOS 115 & BIOS 116	Biology Core II: Genetics and Biology Core II: Genetics Laboratory	4

BIOS 121 & BIOS 122	Biology Core III: Integrative & Comparative Biology and Biology Core III: Integrative and Comparative Lab	4
BIOS 371	Elements of Biochemistry I	3
BIOS 372	Elements of Biochemistry II	3

Physics

Select one of the following: 5

PHY 010 & PHY 012	General Physics I and Introductory Physics Laboratory I	
PHY 011 & PHY 012	Introductory Physics I and Introductory Physics Laboratory I	

Select one of the following: 4-5

PHY 013 & PHY 022	General Physics II and Introductory Physics Laboratory II	
PHY 021 & PHY 022	Introductory Physics II and Introductory Physics Laboratory II	

Math

MATH 012	Basic Statistics	4
----------	------------------	---

Select one of the following: 7-8

MATH 021 & MATH 022	Calculus I and Calculus II	
MATH 051 & MATH 052	Survey of Calculus I and Survey of Calculus II	

Total Credits 54-56

Required Non-Science Courses

First-Year Seminar		3-4
English Comp & Lit (I and II)		6
Humanities (two courses)		8
PSYC 001	Introduction to Psychology	4
SOC 001	Introduction to Sociology	4
Writing Intensive		3-4
Approved Electives		17-20

Total Credits 45-50

Combined-Degree Program in Dentistry

In cooperation with the School of Dental Medicine at the University of Pennsylvania, Lehigh offers an accelerated program that enables selected students to earn both the baccalaureate degree (B.A.) with a major in premedical science and the doctor of dental medicine degree (D.M.D.) after seven years of study at the two institutions. In the first three academic years at Lehigh, credit hours are earned toward the 120 credits required for the baccalaureate degree. The next four years are spent in the regular program of dental education at the Penn School of Dental Medicine in Philadelphia. By successfully completing their first year at the dental school, students acquire the necessary additional credit hours for the Lehigh baccalaureate degree.

During their first three years at Lehigh, students are expected to make satisfactory progress in prescribed academic areas as well as in the area of personal growth, developing those attributes ultimately needed to become a dentist. Penn Dental School receives student grades and monitors student progress through feedback from Lehigh. Students are expected to attain specified grade point averages and DAT scores. Students' undergraduate credentials are processed through the Admissions Committee of Penn Dental School before a final definitive acceptance is offered. The dental college reserves the right to withdraw an acceptance, or require that a student spend additional time on the undergraduate level, on the grounds of academic or personal maturation concerns.

Application for admission to this program is made through Lehigh's Office of Admissions. Application deadline is January 1.

Required Science and Math Courses

Chemistry

Select one of the following: 8

CHM 030 & CHM 031	Introduction to Chemical Principles and Chemical Equilibria in Aqueous Systems	
CHM 040 & CHM 041	Honors General Chemistry I and Honors General Chemistry II	
CHM 110 & CHM 111	Organic Chemistry I and Organic Chemistry Laboratory I	4
CHM 112 & CHM 113	Organic Chemistry II and Organic Chemistry Laboratory II	4
Biology		
BIOS 041 & BIOS 042	Biology Core I: Cellular and Molecular and Biology Core I: Cellular and Molecular Lab	4
BIOS 115 & BIOS 116	Biology Core II: Genetics and Biology Core II: Genetics Laboratory	4
BIOS 121 & BIOS 122	Biology Core III: Integrative & Comparative Biology and Biology Core III: Integrative and Comparative Lab	4
BIOS 371	Elements of Biochemistry I	3
BIOS 372	Elements of Biochemistry II	3
Physics		
Select one of the following:		5
PHY 010 & PHY 012	General Physics I and Introductory Physics Laboratory I	
PHY 011 & PHY 012	Introductory Physics I and Introductory Physics Laboratory I	
Select one of the following:		4-5
PHY 013 & PHY 022	General Physics II and Introductory Physics Laboratory II	
PHY 021 & PHY 022	Introductory Physics II and Introductory Physics Laboratory II	
Math		
MATH 012	Basic Statistics	4
Select one of the following:		7-8
MATH 021 & MATH 022	Calculus I and Calculus II	
MATH 051 & MATH 052	Survey of Calculus I and Survey of Calculus II	

Total Credits 54-56

Required Non-Science Courses

First-Year Seminar	3-4
English Comp & Lit (I and II)	6
Humanities (two courses)	8
Social Sciences (two courses)	8
Junior Writing Intensive	3-4
Approved Electives	11-12

Total Credits 39-42

Combined-Degree Program in Optometry

In cooperation with the State University of New York College of Optometry in New York City, Lehigh offers an accelerated program in which students may earn both the baccalaureate degree (B.A.) with a major in behavioral neuroscience and the doctor of optometry degree (O.D.) after seven years of study at the two institutions. In the first three academic years at Lehigh, credit hours are earned toward the 120 credits required for the baccalaureate degree. The next four years are spent in the regular program of optometry education at SUNY College of Optometry. By successfully completing their first year at the optometry college, students acquire the necessary additional credit hours for the Lehigh baccalaureate degree.

SUNY College of Optometry receives student grades and monitors student progress through feedback from Lehigh. Students are expected to attain specified grade point averages and OAT scores. Students' undergraduate credentials are processed through the

Admissions Committee of SUNY Optometry before a final definitive acceptance is offered. The optometry college reserves the right to withdraw an offer of acceptance on the grounds of academic or personal maturation concerns.

Students may apply to this program either during their initial application or during their enrollment at Lehigh. Application for incoming students is made through Lehigh's Office of Admissions. Application deadline is January 1.

Required Science and Math Courses

Chemistry

Select one of the following: 8

CHM 030 & CHM 031	Introduction to Chemical Principles and Chemical Equilibria in Aqueous Systems	
CHM 040 & CHM 041	Honors General Chemistry I and Honors General Chemistry II	
CHM 110 & CHM 111	Organic Chemistry I and Organic Chemistry Laboratory I	4
CHM 112 & CHM 113	Organic Chemistry II and Organic Chemistry Laboratory II	4

Biology

BIOS 041 & BIOS 042	Biology Core I: Cellular and Molecular and Biology Core I: Cellular and Molecular Lab	4
BIOS 115 & BIOS 116	Biology Core II: Genetics and Biology Core II: Genetics Laboratory	4
BIOS 121 & BIOS 122	Biology Core III: Integrative & Comparative Biology and Biology Core III: Integrative and Comparative Lab	4
BIOS 130	Biostatistics	4
BIOS 276	Central Nervous System and Behavior	3

Select one of the following: 2

BIOS 277	Experimental Neuroscience Laboratory	
BIOS 278	Neurophysiology Laboratory	
BIOS 279	Experimental Molecular Neuroscience Laboratory	
BIOS 371	Elements of Biochemistry I	3
BIOS 372	Elements of Biochemistry II	3
BIOS 382	Endocrinology of Behavior	3

Physics

Select one of the following: 5

PHY 010 & PHY 012	General Physics I and Introductory Physics Laboratory I	
PHY 011 & PHY 012	Introductory Physics I and Introductory Physics Laboratory I	

Select one of the following: 4-5

PHY 013 & PHY 022	General Physics II and Introductory Physics Laboratory II	
PHY 021 & PHY 022	Introductory Physics II and Introductory Physics Laboratory II	

Math

Select one of the following: 7-8

MATH 021 & MATH 022	Calculus I and Calculus II	
MATH 051 & MATH 052	Survey of Calculus I and Survey of Calculus II	

Total Credits 62-64

Required Non-Science Courses

First-Year Seminar	3-4	
English Comp & Lit (I and II)	6	
PSYC 001	Introduction to Psychology	4

Social Science (one course)	4
Humanities (two courses)	8
Writing Intensive	3-4
Approved Elective	4
Total Credits	32-34

MINORS OUTSIDE OF CAS

Students also have the opportunity to apply to the following minor programs:

ENGINEERING MINOR

The College of Engineering enables undergraduate students enrolled in the Colleges of Arts and Sciences and in the College of Business and Economics to earn a minor in engineering. This unique program provides students with insight into the world of engineers: who they are, what they do, and how they think. Students pursuing the Engineering Minor develop an understanding of the tools and techniques engineering use on a day-to-day basis.

The mission of the minor is to educate non-engineering students about engineering methodology, specifically how engineers solve problems; how they design, manufacture, and analyze problems; and how other factors such as economics, safety, ethics, and environmental issues affect the engineering design process. Fifteen credit hours of required and elective coursework are required to fulfill the engineering minor. For more information about this minor: <http://www.lehigh.edu/~inengmnr/index.html>

BUSINESS MINOR

The purpose of the business minor program is to enable non-CBE students to pursue a course of business studies which enables them to supplement their major studies and enhances their career options upon graduation. The overall learning objective of the program is to provide non-CBE students with the knowledge and skills with which to make more informed business decisions.

Courses offered in the business minor program are not open to students currently in the CBE, nor may these classes count as substitutes for CBE core classes should a student later decide to transfer into the CBE. For more information about this minor: <http://cbe.lehigh.edu/academics/undergraduate/degree-programs/business-minor>

MARKETING MINOR

Lehigh University's marketing minor provides non-CBE students an opportunity to pursue a course of study in marketing that will enable them to supplement their major field and make them more marketable.

The overall learning objective of the program is to provide non-CBE students with the knowledge and skills which to make more informed marketing decisions.

A marketing minor consists of 12 credits. Students wishing to earn a Marketing Minor must take MKT 111, and then select three other marketing courses from the marketing curriculum. A student can also build a concentration within the Marketing Minor in areas such as Marketing Analytics, Marketing Communications, Sales Management, Retail Management, or Brand Management and Innovation, allowing for a deeper understanding of a particular aspect of marketing. For more information about this minor: <http://cbe.lehigh.edu/marketing/marketing-minor>

EDUCATION MINOR

The education minor helps undergraduates explore career options in school teaching or other professional careers with elementary, secondary, or special education students. The minor may accelerate entry into a teaching career because appropriate credits from undergraduate coursework may be applied to one of Lehigh's graduate-level Teacher Education Programs.

The minor offers a systematic background of professional education experiences, coordinating practicum activities with theory courses designed to provide a foundation for future educational studies. Its focus is exploratory.

The experiences of the minor are intended to enrich an individual's understanding of education as a central intellectual activity of our

culture and to provide self-understanding of one's own potential as an educator.

An undergraduate may take these courses with the approval of the adviser and minimum GPA of 2.75. Completion of the minor does not assure admission to one of the Teacher Education Programs to become a certified elementary or secondary teacher.

Fifteen credit hours are required for the education minor.

Completion of the minor does not guarantee subsequent admission into any of the College of Education degree or certification programs.

For more information about our Education Minor, visit <http://coe.lehigh.edu/academics/disciplines/teachered> or contact the Teaching, Learning and Technology Program Director at TLTProgram@Lehigh.edu or 610-758-3230.

FIVE-YEAR BACHELOR'S PLUS MASTER'S OF EDUCATION AND SECONDARY TEACHER CERTIFICATION

The College of Education offers a five-year degree program that is designed to allow students to earn both a bachelor's degree and a master's degree in five years instead of the traditional six.

The combined degree program leads to (1) a B.A./B.S. degree in an academic discipline from the College of Arts and Sciences, the P.C. Rossin College of Engineering and Applied Sciences, or the College of Business and Economics, and (2) an M.Ed. degree in elementary education or an M.Ed. or M.A. degree in secondary education. In addition, students also earn eligibility for an Instructional I teaching certificate from the Pennsylvania Department of Education (PDE). These PDE certification areas are:

- Biology 7-12
- Chemistry 7-12
- Earth and Space Science K-12
- English 7-12
- General Science 7-12
- Mathematics 7-12
- Physics 7-12
- PreK-4th grade
- Social Studies 7-12

Freshmen, sophomores and juniors with a minimum overall GPA of 2.75 may apply to the 5-year teacher education program. Those accepted typically begin education courses in the second semester of their sophomore year (junior year for those admitted later).

Criteria for admission to the program include:

- A demonstrable commitment to learning and intellectual growth
- An expressed interest in teaching as a career
- Previous experience in working with young people; this can be gained in the summers of freshman and sophomore years.

In the fall semester of their senior year, students must complete an application for admission to the graduate College of Education (elementary or secondary education) in order to continue in the program and complete the master's degree/Instructional Level I teacher certification eligibility portion of the program.

For more information about the 5-year Teacher Education Program, visit <http://coe.lehigh.edu/academics/disciplines/teachered> or contact the Teaching, Learning, and Technology Program Director at TLTProgram@Lehigh.edu or 610-758-3230.