

# UNDERGRADUATE CATALOG 2017–18

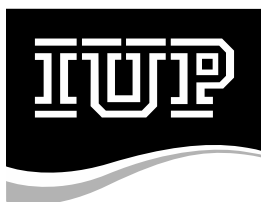
## NATURAL SCIENCE PROGRAM

COLLEGE OF NATURAL SCIENCES AND MATHEMATICS

[www.iup.edu/preprofessional](http://www.iup.edu/preprofessional)

This document is a direct extract from the full 2017–18 *Undergraduate Catalog*. As a result, the original page numbering will appear.

For information on other colleges at IUP, or about specific courses, please consult the full 2017–18 catalog, available at [www.iup.edu/registrar/catalog](http://www.iup.edu/registrar/catalog). Earlier catalogs are also available at this web address.



Indiana University of Pennsylvania

## Natural Science

**Website:** [www.iup.edu/preprofessional](http://www.iup.edu/preprofessional)

**Robert Hinrichsen, Coordinator**

The program leading to the BS degree with a major in natural science is designed to prepare students for admission to professional schools—chiropractic, dentistry, optometry, pharmacy, podiatry, physical therapy, physician assistant, and audiology. If they qualify, the BS degree with a major in natural science can be earned by students who are accepted for early admission to professional schools that have an articulation agreement with IUP. In some cases, students interested in obtaining a four-year degree before entering a medical or professional school should enroll in a program leading to a BA or BS degree in the departments of Biology or Chemistry. Students considering a professional career in a high-technology business or health-oriented businesses or industries may wish to obtain a foundation in the natural sciences while using their free electives to pursue additional work in areas such as molecular biology, biochemistry, psychology, economics, pre-law, or athletic training. The BS program with a major in natural science may not be used for a second major or a second degree by majors in the College of Natural Sciences and Mathematics. For further information, contact the Natural Science program coordinator.

## Bachelor of Science—Natural Science

**Liberal Studies:** As outlined in Liberal Studies section with the following specifications: 48

**Mathematics:** MATH 121

**Natural Science:** CHEM 111-112

**Social Science:** PSYC 101

**Writing Intensive:** A second writing-intensive course is not required for three-year students who transfer to a professional school with an articulation agreement.

**Liberal Studies Elective:** 3cr, BTED/COSC/IFMG 101; no courses with SCI prefix

**Major:** 43

### Required Courses:

#### Biology:

BIOL 150	Human Anatomy	4cr
BIOL 201	Principles of Ecology and Evolution	4cr
BIOL 202	Principles of Cell and Molecular Biology	4cr
BIOL 203	Principles of Genetics and Development	4cr
BIOL 240	Human Physiology	4cr
BIOL 241	Introductory Medical Microbiology	4cr

#### Chemistry:

CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II <i>or</i>	
<i>or</i> 351	Biochemistry	4cr

#### Physics:

PHYS 111	Physics I Lecture	3cr
PHYS 121	Physics I Lab	1cr
PHYS 112	Physics II Lecture	3cr
PHYS 122	Physics II Lab	1cr

#### Mathematics:

MATH 216	Probability and Statistics for Natural Sciences	3cr
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#### Other Requirements:

Foreign Language Intermediate Level 0-6

**Free Electives:** 23-29

**Total Degree Requirements:** 120

## Bachelor of Science—Natural Science/Pre-audiology Track (\*)

**Liberal Studies:** As outlined in Liberal Studies section with the following specifications: 45

**Mathematics:** MATH 121

**Natural Science:** CHEM 111-112

**Social Science:** PSYC 101, ECON 101 (or ECON 121)

**Writing Intensive:** ENGL 222 (this second writing-intensive course is not required for three-year students who transfer to a professional school with an articulation agreement.)

**Liberal Studies Elective:** 3cr, BTED/COSC/IFMG 101; no courses with SCI prefix

**Major:** 45

### Required Courses:

BIOL 150	Human Anatomy	4cr
BIOL 201	Principles of Ecology and Evolution	4cr
BIOL 202	Principles of Cell and Molecular Biology	4cr
BIOL 203	Principles of Genetics and Development	4cr
BIOL 240	Human Physiology	4cr
BIOL 477	Neurobiology	3cr
EDHL 114	Introduction to Deaf and Hard-of-Hearing Persons	3cr
MATH 216	Probability and Statistics for Natural Sciences <i>or</i> Probability and Statistics	3cr
<i>or</i> 217		
PHYS 111	Physics I Lecture	3cr
PHYS 121	Physics I Lab	1cr
SPLP 222	Introduction to Audiology	3cr

SPLP 311	Aural Rehabilitation	3cr
SPLP 312	Advanced Audiology and Hearing Disorders	3cr
SPLP 422	Central Auditory Processing Disorders in the Educational Setting	3cr

#### Other Requirements:

EDHL 115	Introduction to American Sign Language	3cr
EDHL 215	Intermediate American Sign Language	3cr

**Free Electives:** (1) 24

**Total Degree Requirements:** 120

(\*) Students accepted for early admission to an accredited post-graduate Doctor of Audiology (AuD) program within the US must complete a minimum 96cr, including all of the program requirements listed above. After completing their first year of professional school studies, the student can transfer back to IUP up to 30cr of their AuD program course work. To then graduate from IUP, the student must send an official copy of their transcripts (and a cover letter) to the IUP office of Transfer Services. They must also contact the dean of the College of Natural Sciences and Mathematics for instructions on applying for graduation.

(1) The student, under consultation with her/his advisor, should select as their free electives courses that are appropriate for their targeted post-graduate AuD programs.

## Bachelor of Science—Natural Science/Pre-chiropractic Track (\*)

**Liberal Studies:** As outlined in Liberal Studies section with the following specifications: 48

**Mathematics:** MATH 121

**Natural Science:** CHEM 111-112

**Social Science:** PSYC 101

**Writing Intensive:** A second writing-intensive course is not required for three-year students who transfer to a professional school with an articulation agreement.

**Liberal Studies Elective:** 3cr, COSC 101, no courses with SCI prefix

**Major:** 43

### Required Courses:

BIOL 150	Human Anatomy	4cr
BIOL 201	Principles of Ecology and Evolution	4cr
BIOL 202	Principles of Cell and Molecular Biology	4cr
BIOL 203	Principles of Genetics and Development	4cr
BIOL 240	Human Physiology	4cr
BIOL 241	Introductory Medical Microbiology	4cr
CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II <i>or</i>	
<i>or</i> 351	Biochemistry	4cr
PHYS 111	Physics I Lecture	3cr
PHYS 121	Physics I Lab	1cr
PHYS 112	Physics II Lecture	3cr
PHYS 122	Physics II Lab	1cr
MATH 216	Probability and Statistics for Natural Sciences	3cr

#### Other Requirements:

Foreign Language Intermediate Level 0-6

**Free Electives:** (1) 23-29

Electives to meet minimum of 90 IUP cr and minimum of 24cr in Humanities and Social Sciences for admission to affiliated chiropractic colleges after three years at IUP

Maximum cr for work at affiliated chiropractic school 30cr

**Total Degree Requirements:** 120

(\*) Accelerated three-year New York Chiropractic College, Logan Chiropractic College, Sherman Chiropractic College, and Parker Chiropractic programs. A maximum of 30cr of work may be transferred after the first year at one of the chiropractic school programs. Upon completion of the first year of studies at one of the chiropractic school programs, a transcript from that school is to be sent by the student to the dean of the

College of Natural Sciences and Mathematics with a note requesting application materials for graduation.

(1) Student is to work with his/her advisor to select appropriate free electives for professional school. Additional courses in biology and KHSS 315 or 345 are recommended.

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### Bachelor of Science—Natural Science/Pre-dentistry Track (\*)

**Liberal Studies:** As outlined in Liberal Studies section with the following specifications: 48

**Mathematics:** MATH 121

**Natural Science:** CHEM 111-112

**Social Science:** PSYC 101

**Writing Intensive:** A second writing-intensive course is not required for three-year students who transfer to a professional school with an articulation agreement.

**Liberal Studies Elective:** 3cr, COSC 101, no courses with SCI prefix

**Major:** 43

**Required Courses:**

BIOL 150	Human Anatomy	4cr
BIOL 201	Principles of Ecology and Evolution	4cr
BIOL 202	Principles of Cell and Molecular Biology	4cr
BIOL 203	Principles of Genetics and Development	4cr
BIOL 240	Human Physiology	4cr
BIOL 241	Introductory Medical Microbiology	4cr
CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II <i>or</i>	
<i>or</i> 351	Biochemistry	4cr
PHYS 111	Physics I Lecture	3cr
PHYS 121	Physics I Lab	1cr
PHYS 112	Physics II Lecture	3cr
PHYS 122	Physics II Lab	1cr
MATH 216	Probability and Statistics for Natural Sciences	3cr

**Other Requirements:** 0-6

Foreign Language Intermediate Level

**Free Electives: (1)** 23-29

Electives to meet minimum of 90 IUP cr and minimum of 24cr in Humanities and Social Sciences for admission to affiliated dental school after three years at IUP

Maximum cr for work at affiliated dental school 30cr

**Total Degree Requirements:** 120

(\*) Accelerated three-year Temple University School of Dentistry program. A maximum of 30cr of work may be transferred after the first year at Temple University School of Dentistry. Upon completion of the first year of studies at Temple University School of Dentistry, a transcript from Temple University is to be sent by the student to the dean of the College of Natural Sciences and Mathematics with a note requesting application materials for graduation.

(1) Student is to work with his/her advisor to select appropriate free electives for professional school. Ceramics and additional courses in biology are highly recommended.

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### Bachelor of Science—Natural Science/Pre-optometry Track (\*)

**Liberal Studies:** As outlined in Liberal Studies section with the following specifications: 48

**Mathematics:** MATH 121

**Natural Science:** CHEM 111-112

**Social Science:** ECON 101, PSYC 101

**Writing Intensive:** A second writing-intensive course is not required for three-year students who transfer to a professional school with an articulation agreement.

**Liberal Studies Elective:** 3cr, COSC 101, no courses with SCI prefix

**Major:** 43

**Required Courses:**

BIOL 150	Human Anatomy	4cr
BIOL 201	Principles of Ecology and Evolution	4cr
BIOL 202	Principles of Cell and Molecular Biology	4cr
BIOL 203	Principles of Genetics and Development	4cr
BIOL 240	Human Physiology	4cr
BIOL 241	Introductory Medical Microbiology	4cr
CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II <i>or</i>	
<i>or</i> 351	Biochemistry	4cr
PHYS 111	Physics I Lecture	3cr
PHYS 121	Physics I Lab	1cr
PHYS 112	Physics II Lecture	3cr
PHYS 122	Physics II Lab	1cr
MATH 216	Probability and Statistics for Natural Sciences	3cr

**Other Requirements:** 0-6

Foreign Language Intermediate Level

**Free Electives: (1)** 23-29

Electives to meet minimum of 90 IUP cr and minimum of 24cr in Humanities and Social Sciences for admission to affiliated optometry school after three years at IUP

Maximum cr for work at affiliated optometry school 30cr

**Total Degree Requirements:** 120

(\*) Accelerated three-year Pennsylvania College of Optometry (PCO) program. A maximum of 30cr of work may be transferred after the first year at PCO. Upon completion of the first year of studies at PCO, a transcript from PCO is to be sent by the student to the dean of the College of Natural Sciences and Mathematics with a note requesting application materials for graduation.

(1) Student is to work with his/her advisor to select appropriate free electives for professional school. Neurobiology and optics are highly recommended courses.

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### Bachelor of Science—Natural Science/Pre-pharmacy Track (\*)

**Liberal Studies:** As outlined in Liberal Studies section with the following specifications: 48

**Mathematics:** MATH 121

**Natural Science:** CHEM 111-112

**Social Science:** ECON 101, PSYC 101

**Writing Intensive:** A second writing-intensive course is not required for three-year students who transfer to a professional school with an articulation agreement.

**Liberal Studies Elective:** 3cr, COSC 101, no courses with SCI prefix

**Major:** 43

**Required Courses:**

BIOL 150	Human Anatomy	4cr
BIOL 201	Principles of Ecology and Evolution	4cr
BIOL 202	Principles of Cell and Molecular Biology	4cr
BIOL 203	Principles of Genetics and Development	4cr
BIOL 240	Human Physiology	4cr
BIOL 241	Introductory Medical Microbiology	4cr
CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II <i>or</i>	
<i>or</i> 351	Biochemistry	4cr
PHYS 111	Physics I Lecture	3cr
PHYS 121	Physics I Lab	1cr
PHYS 112	Physics II Lecture	3cr
PHYS 122	Physics II Lab	1cr
MATH 216	Probability and Statistics for Natural Sciences	3cr

**Other Requirements:** 0-6

Foreign Language Intermediate Level

**Free Electives:** (1) 23-29  
 Electives to meet minimum of 90 IUP cr and minimum of 24cr in Humanities and Social Sciences for admission to affiliated pharmacy school after three years at IUP  
 Maximum cr for work at affiliated pharmacy school 30cr

**Total Degree Requirements:** 120

- (\*) Accelerated three-year Shenandoah University School of Pharmacy (SUSP) or Lake Erie College of Osteopathic Medicine School of Pharmacy (LECOMP) program. A maximum of 30cr may be transferred after first year at SUSP or LECOMP. Upon completion of the first year of studies at either SUSP or LECOMP, a transcript from SUSP or LECOMP is to be sent by the student to the dean of the College of Natural Sciences and Mathematics at IUP with a note requesting application materials for graduation.
- (1) Student is to work with his/her advisor to select appropriate free electives for professional school. Additional courses in chemistry and COMM 101 are recommended.

**Bachelor of Science—Natural Science/Pre-physical Therapy Track (\*)**

**Liberal Studies:** As outlined in Liberal Studies section with the following specifications: 48  
**Mathematics:** MATH 121  
**Natural Science:** CHEM 111-112  
**Social Science:** ECON 101, PSYC 101  
**Writing Intensive:** A second writing-intensive course is not required for three-year students who transfer to a professional school with an articulation agreement.  
**Liberal Studies Elective:** 3cr, COSC 101, no courses with SCI prefix

**Major:** 43

**Required Courses:**

BIOL 150	Human Anatomy	4cr
BIOL 201	Principles of Ecology and Evolution	4cr
BIOL 202	Principles of Cell and Molecular Biology	4cr
BIOL 203	Principles of Genetics and Development	4cr
BIOL 240	Human Physiology	4cr
BIOL 241	Introductory Medical Microbiology	4cr
CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II <i>or</i>	4cr
<i>or</i> 351	Biochemistry	4cr
PHYS 111	Physics I Lecture	3cr
PHYS 121	Physics I Lab	1cr
PHYS 112	Physics II Lecture	3cr
PHYS 122	Physics II Lab	1cr
MATH 216	Probability and Statistics for Natural Sciences	3cr

**Other Requirements:** 0-6  
 Foreign Language Intermediate Level

**Free Electives:** (1) 23-29  
 Electives to meet minimum of 90 IUP cr and minimum of 24cr in Humanities and Social Sciences for admission to affiliated physical therapy school after three years at IUP  
 Maximum cr for work at affiliated physical therapy school 30cr

**Total Degree Requirements:** 120

- (\*) Accelerated three-year Gannon University School of Physical Therapy program. A maximum of 30cr of work may be transferred after the first year at Gannon University School of Physical Therapy. Upon completion of the first year of studies at one of the physical therapy schools, a transcript from that school is to be sent by the student to the dean of the College of Natural Sciences and Mathematics with a note requesting application materials for graduation. Articulation agreement with Chatham University School of Physical Therapy requires a BS from IUP.

- (1) Student is to work with his/her advisor to select appropriate free electives for professional school. Neurobiology, biomechanics, and athletic training are highly recommended.

**Bachelor of Science—Natural Science/Pre-physician Assistant Track (\*)**

**Liberal Studies:** As outlined in Liberal Studies section with the following specifications: 45

**Mathematics:** MATH 121  
**Natural Science:** CHEM 111-112  
**Social Science:** PSYC 101

**Writing Intensive:** A second writing-intensive course is not required for three-year students who transfer to a professional school with an articulation agreement.

**Liberal Studies Elective:** 3cr, BTED/COSC/IFMG 101, no courses with SCI prefix

**Major:** 49

**Required Courses:**

BIOL 200	Medical Terminology	2cr
BIOL 201	Principles of Ecology and Evolution	4cr
BIOL 202	Principles of Cell and Molecular Biology	4cr
BIOL 203	Principles of Genetics and Development	4cr
BIOL 240	Human Physiology	4cr
BIOL 241	Introductory Medical Microbiology	4cr
BIOL 402	Advanced Human Anatomy	4cr
CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II	4cr
CHEM 351	Biochemistry	4cr
MATH 216	Probability and Statistics for Natural Sciences <i>or</i>	3cr
<i>or</i> 217	Probability and Statistics	
PHYS 111	Physics I Lecture	3cr
PHYS 121	Physics I Lab	1cr
PHYS 112	Physics II Lecture	3cr
PHYS 122	Physics II Lab	1cr

**Other Requirements:** 0-4  
 Foreign Language through Intermediate Level

**Free Electives:** (1) 22-26

**Total Degree Requirements:** 120

- (\*) Students accepted for early admission to an accredited post-graduate Physician Assistant (PA) program within the United States must complete at minimum 90cr, including all of the program requirements listed above. After completing the first year of professional school studies, the student can transfer back to IUP up to 30cr of the PA program course work. To graduate from IUP, the student must send an official copy of their transcripts (and a cover letter) to the IUP Office of Transfer Services. The student must also contact the Dean's Office of the College of Natural Sciences and Mathematics for instructions on applying for graduation.

- (1) The student, under consultation with her/his advisor, should select free electives courses that are appropriate for the student's targeted post-graduate PA programs.

**Bachelor of Science—Natural Science/Pre-podiatry Track (\*)**

**Liberal Studies:** As outlined in Liberal Studies section with the following specifications: 48

**Mathematics:** MATH 121  
**Natural Science:** CHEM 111-112  
**Social Science:** ECON 101, PSYC 101

**Writing Intensive:** A second writing-intensive course is not required for three-year students who transfer to a professional school with an articulation agreement.

**Liberal Studies Elective:** 3cr, COSC 101, no courses with SCI prefix

**Major:** 43

**Required Courses:**

BIOL 150	Human Anatomy	4cr
BIOL 201	Principles of Ecology and Evolution	4cr
BIOL 202	Principles of Cell and Molecular Biology	4cr
BIOL 203	Principles of Genetics and Development	4cr
BIOL 240	Human Physiology	4cr
BIOL 241	Introductory Medical Microbiology	4cr
CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II <i>or</i>	
<i>or</i> 351	Biochemistry	4cr
PHYS 111	Physics I Lecture	3cr
PHYS 121	Physics I Lab	1cr
PHYS 112	Physics II Lecture	3cr
PHYS 122	Physics II Lab	1cr
MATH 216	Probability and Statistics for Natural Sciences	3cr

**Other Requirements:** 0-6

Foreign Language Intermediate Level

**Free Electives: (1)** 23-29

Electives to meet minimum of 90 IUP cr and minimum of 24cr in Humanities and Social Sciences for admission to affiliated podiatry school after three years at IUP

Maximum cr for work at affiliated podiatry school 30cr

**Total Degree Requirements:** 120

(\*) Accelerated three-year Temple University School of Podiatry program. A maximum of 30cr may be transferred after the first year at Temple University School of Podiatry. Upon completion of the first year of studies at Temple University School of Podiatry, a transcript from Temple University is to be sent by the student to the dean of the College of Natural Sciences and Mathematics at IUP with a note requesting application materials for graduation.

(1) Student is to work with his/her advisor to select appropriate free electives for professional school. Additional courses in biology are recommended.

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