

BIOENGINEERING PROGRAM (3+2, B.S.-BIOLOGY/M.S.- BIOENGINEERING)

Recommended

- A Global Learning (GL) Experience (<http://catalog.walsh.edu/undergraduate/academic-services/#globallearning>)

Required

- General Education Requirements (<http://catalog.walsh.edu/undergraduate/general-education-curriculum/>)
- Internship

Code	Title	Hours
Biology		
BIO 101	FD: T1:Principles of Biology I	3
BIO 101L	Principles of Biology I: Lab	1
BIO 102	Principles of Biology II	3
BIO 102L	Principles of Biology II: Lab	1
BIO 120	Intro to Bioinformatics	3
BIO 206	Microbiology	3
BIO 206L	Microbiology: Lab	1
BIO 306	Cell Biology	3
BIO 307	Essential Biochemistry (counts as CHM420 at UD)	3
BIO 410	Topics in Biology (Cellular & Molecular Techniques - counts as BIE 507 at UD)	3
Chemistry		
CHEM 101	FD:T1:Princ of Chemistry I	3
CHEM 101L	Principles of Chemistry I: Lab	1
CHEM 102	Principles of Chemistry II	3
CHEM 102L	Principles of Chemistry II:Lab	1
CHEM 208	Organic Chemistry I	2
CHEM 201L	Organic Chemistry I: Lab	1
CHEM 209	Organic Chemistry II	2
CHEM 202L	Organic Chemistry II: Lab	1
CHEM 210	Organic Chemistry III	2
Mathematics Minor		
MATH 210A	Calculus I	3
MATH 211	Calculus II	3
MATH 221	Statistics	3
MATH 310A	Calculus III	3
MATH 311A	Calculus IV	3
MATH 410	Elem Differential Equations	3
Physics		
PHYS 201	Physics with Calculus I	3
PHYS 101L	Principles of Physics I: Lab	1
PHYS 202	Physics with Calculus II	3
PHYS 102L	Principles of Physics II: Lab	1
Total Hours		67

*Math and Science requirements in major also fulfill core requirements; MATH 155 and MATH 156 are prerequisites for MATH 207.

Year 4 at the University of Dayton or the University of Akron may start with courses in summer following the Walsh junior year. The summer, fall and spring of year 4 will be at the University of Dayton or the University of Akron. Total credits at UD or UA, including summer, fall and spring for year 4 will be 25 credit hours of engineering courses.

The first 3 years at Walsh will include the first page of this curriculum sheet as well as the majority of the general education curriculum. It may require some summer courses to complete this major in the 3 + 2 window. Check with your advisor for details.

At the end of the spring semester in year 4, the BS in Biology from Walsh will have been earned and you will graduate from Walsh. You will then need to apply to the UD or UA Master's program (see advisor for details) to complete the 5th year at UD or UA. Once accepted into the UD or UA Master's program, you will complete summer, fall and spring courses at UD or UA (and thesis work if chosen) to finish an MS in Bioengineering from UD or UA in the spring of year 5.

During year 4, the Walsh pre-engineering student will have both a Walsh and a UD or UA advisor. Special considerations will be made to work with athletes and honors students.

The exact courses involved in this program are subject to change between 2017-2020 as we optimize this new process. All changes will benefit students enrolled.

Code	Title	Hours
Bioengineering (Year 4 at University of Dayton):		
BIO 390	Biology Internship (during summer after year 3 at UD)	3
	General Education Course Counting for Walsh	3
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BIE 501	Introduction to Bioengineering (graduate)	3
BIE 505	Principles of Engineering for Bioengineers (graduate)	3
BIE 561	Biomedical Engineering I (graduate)	3
BIE 597	Research Methods	3
BIE Elective:	Select Course from Emphasis Area (7 choices)	3
CME 582	Advanced Chemical Engineering Calculations II	3
EGR 202	Introduction to Thermodynamics	3
MTH 527	Biostatistics	3
Total Hours		33
Biomedical Engineering (University of Akron)		
Fall 2nd Year		
4300:201	Staics	3
Spring 2nd Year		
3450:335	Differential Equations at Walsh	3
4600: 203	Dynamics	3
Fall 3rd Year		
4300:202	Mechanics of Solids	3
Spring 3rd Year		
4800: 400	Biomaterials	3
Fall 4th Year		
4800: 362	Transport Fundamentals for BME	3

4400: 307 Basic Electrical Engineering	4
Biomedical Engineering Electives	6
Spring 4th Year	
4600: 300 Thermodynamics I at UA	3
Biomedical Engineering Electives	3
Biomedical Engineering Electives	3
Engineering Electives	3
Fall 5th Year (Thesis Option)	
4800: 605 Fundamentals of Biomedical Engineering	4
4800: 606 Physiology for Biomedical Science and Engineering	3
4800: 600 Biomedical Engineering Graduate Colloquium	1
4800: 699 Master's Thesis	3
Spring 5th Year (Thesis Option)	
4800: 611 Biometry	3
4800: 699 Master's Thesis	3
Approved Electives	4
Fall 5th Year (Non-Thesis Option)	
4800: 605 Fundamentals of Biomeical Engineering	4
4800: 606 Physiology for Biomedical Science and Engineering	3
4800: 600 Biomedical Engineering Graduate Colloquium	1
Approved Electives	3
Spring 5th Year (Non-Thesis Option)	
4800: 611 Biometry	
Approved Math/Science	3
Approved Electives	4
Engineering Report	2