BIOLOGICAL/PRE-MEDICAL ILLUSTRATION

Overview

The interdepartmental undergraduate BPM I major is designed for students who want to combine their interests and aptitudes in science and art. Based on the theme of *Communicating Science Through Art*, the major prepares students for careers in biological visualization/illustration or for graduate education in medical visualization/illustration. Graduates enter fields such as biocommunications, environmental display design, freelance illustration, UX/UI and museum display design, creative technologies, instructional design, and various careers in the publishing, research and education, and visual communication industries.

Student Learning Outcomes

Throughout its over 35-year existence, the underlying philosophy of BPM I has been to emphasize both art and science; students take approximately equal credit hours in the two major areas. Another important guiding principle has been visual thinking and problem-solving, and a third is maintaining student proficiency in a wide range of visual communication methods and technologies so they have the skill to choose the most effective tools for a given communication objective. Upon completion of the BPM I Program, graduates will:

- implement effective academic research methods and concept development processes for producing meaningful educational visual solutions
- demonstrate advanced science knowledge in a science focus area of choice (for example, pre-medical, or non-medical areas of life and earth science)
- demonstrate the ability to deconstruct and visualize complex science in order to create accessible, accurate, aesthetic, and meaningful visual representations, including diagrammatic, realistic, and symbolic, for a range of outputs (print, modeled, online, mobile)
- implement interdisciplinary thinking in team-based and independent projects
- flexibly adapt to new technology and communication challenges
- showcase and analyze works by articulating key visual elements in formal presentations, in written and oral format, and during assessments and critiques
- demonstrate effective use of design principles, problem solving skills, and visual organization
- demonstrate career-readiness and professional practice competencies
- exhibit an academic trajectory for engaging in life-long learning

Entrance Requirements

Entrance into the BPM I program is by application to the BPM I Advisory Committee. Eligibility is based on an academic standard of at least 2.00 cumulative GPA on 30 credits of university level work and a consideration of artistic ability as demonstrated through submission of a portfolio of representative drawings or other art work. Freshman and transfer students usually declare pre-BPM I as their major while satisfying the conditions for entrance into the major, although other majors can be declared.

Degree Requirements

The information below outlines the specific requirements for a BA degree in Biological/Pre-Medical Illustration (BPM I). There are four components to a degree in BPM I:

- Liberal arts general education
- Science core and advanced courses
- Art core and advanced courses
- Electives

Part 1. College Requirements

a. Communication Proficiency Requirements

ENGL 150	Critical Thinking and Communication (grade of C or better)	3
ENGL 250	Written, Oral, Visual, and Electronic Composition (grade of C or better)	3
LIB 160	Introduction to College Level Research	1
Choose one course from the following:		3
ENGL 302	Business Communication	
ENGL 316	Creative Writing: Playwriting	
Two semesters of college-level world language		0-8
Students with 3 years in high school world language are exempt		
Total Credits		**10-18**

B. Liberal Arts and Sciences Requirements*

Arts and Humanities **		12
Natural Sciences and Mathematical Disciplines		
MATH 104	Introduction to Probability	3-4
or MATH 140	College Algebra	
or MATH 143	Preparation for Calculus	
or MATH 165	Calculus I	
or STAT 101	Principles of Statistics	
or STAT 104	Introduction to Statistics	
or COM S 107	Windows Application Programming	
or more advanced		
CHEM 163 & 163L	College Chemistry and Laboratory in College Chemistry	5

or CHEM 177	General Chemistry I	
& 177L	and Laboratory in General Chemistry I	
CHEM 231	Elementary Organic Chemistry	4
& 231L	and Laboratory in Elementary Organic Chemistry	
Social Sciences ***		9
Total Credits		**33-34**

* *Choose courses to meet International Perspectives & US Diversity requirements*

** See https://las.iastate.edu/students/academics/general-education/ *Consider HIST 280, HIST 281; ART H 280, ART H 281; DSN S 183*

*** See https://las.iastate.edu/students/academics/general-education/

Part 2. Course Requirements for Major in BPM I (continued in Part 3)

A. Biological Sciences Core

LAS 293D	Special Projects: General (F.)	1
or LAS 101	Orientation for Open Option and Preprofessional Students	
BIOL 211	Principles of Biology I	4
& 211L	and Principles of Biology Laboratory I (F.S.)	
BIOL 212	Principles of Biology II	4
& 212L	and Principles of Biology Laboratory II (F.S.)	
BIOL 255	Fundamentals of Human Anatomy	4-5
& 255L	and Fundamentals of Human Anatomy Laboratory	
or BIOL 256	Fundamentals of Human Physiology	
& BIOL 255L	and Fundamentals of Human Anatomy Laboratory	
or BIOL 313	Principles of Genetics	
& 313L	and Genetics Laboratory	
or BIOL 335	Principles of Human and Other Animal Physiology	
& 335L	and Principles of Human and Other Animal Physiology Laboratory	
or BIOL 350	Comprehensive Human Anatomy	
or BIOL 351	Comparative Chordate Anatomy	
or BIOL 365	Vertebrate Biology	
Note: BIOL 350, 351 and 365 courses include labwork.		
BIOL 356	Dendrology	3-4
or BIOL 366	Plant Systematics	
or BIOL 451	Plant Evolution and Phylogeny	
or BIOL 454	Plant Anatomy	
GEOL 102	History of the Earth	3-4
& 102L	and History of the Earth: Laboratory	
or BIOL 312	Ecology	
or BIOL 315	Biological Evolution	
Total Credits		**19-22**

B. Art Core

DSN S 131	Drawing I (F.S.)	4
ARTIS 230	Drawing II (F.S.)	3
ARTIS 233	Watercolor Painting (F.S.)	3
ARTIS 308	Computer Modeling, Rendering and Virtual Photography (F.S.)	3
ARTIS 330	Drawing III: Life Drawing (F.S.)	3
BPM I 323	Scientific Illustration Principles and Techniques (F.)	3
BPM I 326	Illustration and Illustration Software (S.)	3
BPM I 327	Illustration as Communication (F.)	3
BPM I 337	Application of Scientific Illustration Techniques (S.)	3
BPM I 497	Illustration Internship	1
Total Credits		**29**

Beyond the core preparation, students must take 9 credits in the advanced science area and 12 credits in the advanced art area. The courses acceptable in these areas follow. Other courses in art and biological science may be acceptable. See BPM I advisors and/or the BPM I Advisory Committee.

C. Advanced Art Area

Select 12 total credits from below. At least 6 credits must be studio classes. Some courses can be considered either pre-med illustration or general art; speak with your advisor for guidance.

Pre-Med Illustration Area		
ARCH 335	Three-Dimensional Studio	3
ARTIS 330	Drawing III: Life Drawing	3
ARTIS 408	Principles of 3D Animation	3
ARTIS 430	Drawing IV (F.S.)	3
ARTIS 431	Character and Scene Design	3
ARTIS 432	Sequential Narrative Drawing	3
ARTIS 475	Interactive Art	3
ARTIS 482	Selected Topics in Studio Art	1-3
BPM I 323	Scientific Illustration Principles and Techniques	3
BPM I 326	Illustration and Illustration Software	3
BPM I 337	Application of Scientific Illustration Techniques	3
BPM I 490	Independent Study	1-3
BPM I 491	Portfolio Design and Professional Development (S.)	2
BPM I 494	Special Topics in Illustration	1-3
General Art Area		
ARTIS 213	Studio Fundamentals: Painting (F.S.)	2
ARTIS 227	Introduction to Creative Digital Photography	3

ARTIS 238	Painting I (F.S.)	3
ARTIS 329	Creative Photography	3
ARTIS 338	Painting II	3
ARTIS 356	Relief Printmaking: Digital/Traditional	3-4
ARTIS 357	Intaglio and Monotype Printmaking: Digital / Traditional	3-4
ARTIS 358	Lithography: Digital / Traditional	3
ARTIS 407	Principles of Character Animation	3
ARTIS 409	Computer/Video Game Design and Development	3
ARTIS 438	Painting III (F.S.)	3
ARTIS 473	Video Art	3
BPM I 395	Field Illustration (S.SS.)	1-3
BPM I 406X	Introduction to 3D Organic Modeling in ZBrush	3
BPM I 470X	Data, Code, and Form	3
JL MC 306	Broadcast Media Production (F.S.)	3
JL MC 315	Digital Storytelling (F.S.)	3
STAT 332	Visual Communication of Quantitative Information	3

D. Advanced Science Area

Select 9 credits total from below.

Pre-Med Illustration Science Area - required/recommended courses by most graduate schools		
BBMB 316	Principles of Biochemistry (F.)	3
BIOL 313	Principles of Genetics (F.S.SS.)	3
BIOL 314	Principles of Molecular Cell Biology (F.S.)	3
BIOL 335	Principles of Human and Other Animal Physiology (S.)	3
BIOL 352	Vertebrate Histology (S.)	4
BIOL 423	Developmental Biology (S.)	3
B M S 329	Anatomy and Physiology of Domestic Animals (S.)	3
B M S 448	Principles of Human Gross Anatomy (S.)	4
GEN 340	Human Genetics (F.S.SS.)	3
General Science Area		
A ECL 321	Fish Biology (S.)	3
A ECL 366	Natural History of Iowa Vertebrates (S.)	3
A ECL 457	Herpetology (F.)	2
A ECL 458	Ornithology (S.)	2
A ECL 459	Mammalogy (S.)	2
ANTHR 307	Biological Anthropology (S.)	3
ANTHR 319	Skeletal Biology (F.)	3
ANTHR 424	Forensic Anthropology (S.)	3
BBMB 301	Survey of Biochemistry (S.SS.)	3
BIOL 312	Ecology (F.SS.)	4
BIOL 255 & 255L	Fundamentals of Human Anatomy and Fundamentals of Human Anatomy Laboratory	4
BIOL 256 & 256L	Fundamentals of Human Physiology and Fundamentals of Human Physiology Laboratory	4
BIOL 313L	Genetics Laboratory (F.S.)	1
BIOL 315	Biological Evolution (F.S.)	3
BIOL 328	Molecular and Cellular Biology of Human Diseases (F.)	3
BIOL 336	Ecological and Evolutionary Animal Physiology	3
BIOL 350	Comprehensive Human Anatomy (F.)	4
BIOL 346X	Human Physiology for Health Assessment (plus 346L)	
BIOL 351	Comparative Chordate Anatomy	5
BIOL 353	Introductory Parasitology (S.)	3
BIOL 354	Animal Behavior (F.)	3
BIOL 355	Plants and People (S.)	3
BIOL 356	Dendrology (F.)	3
BIOL 364	Invertebrate Biology (F)	3-4
BIOL 365	Vertebrate Biology (F.)	4
BIOL 366	Plant Systematics (S.)	4
BIOL 393	North American Field Trips in Biology	1-4
BIOL 394	International Field Trips in Biology	1-4
BIOL 402	Introduction to Pathology (F.)	3
BIOL 430	Principles of Plant Physiology	3
BIOL 436	Neurobiology (F.)	3
BIOL 451	Plant Evolution and Phylogeny	4
BIOL 454	Plant Anatomy (F.)	4
BIOL 455	Bryophyte and Lichen Biodiversity	3
BIOL 456	Principles of Mycology (F.)	3
BIOL 474	Plant Ecology (S.)	3
BIOL 488	Identification of Aquatic Organisms (F.S.)	1
BPM I 395	Field Illustration (S.SS.)	1-3
DS 201	Introduction to Data Science	3
DS 202	Data Acquisition and Exploratory Data Analysis	3
ENT 370	Insect Biology (F.)	3
ENT 374	Insects and Our Health (S.)	3
GEOL 102	History of the Earth	3
GEOL 103	Age of Dinosaurs	1
GEOL 108	Introduction to Oceanography	3
GEOL 111	Geological Disasters	1
GEOL 140	Climate and Society	3
GEOL 160	Water Resources of the World	3
GEOL 324	Energy and the Environment	3

GEOL 412	Micropaleontology	3
GEOL 415	Paleoclimatology	3
MICRO 302	Biology of Microorganisms (F.S.SS.)	3
MICRO 302L	Microbiology Laboratory (F.S.)	1
MICRO 310	Medical Microbiology (F.)	3
MTEOR 206	Introduction to Weather and Climate	3
MTEOR 360	Ocean-Atmosphere Interactions	3
MTEOR 404	Global Change	3
NREM 301	Natural Resource Ecology and Soils (F.)	4
NREM 330	Principles of Interpretation (S.)	3
PSYCH 310	Brain and Behavior (F.S.)	3
V PTH 401	Basics of Medical Terminology (F.)	1

As majors in the College of Liberal Arts and Sciences, Biological/Pre-Medical Illustration students must meet College of Liberal Arts and Sciences (http://catalog.iastate.edu/previouscatalogs/2023-2024/collegeofliberalartsandsciences/#lascollegerequirementstext) and University-wide requirements (http://catalog.iastate.edu/previouscatalogs/2023-2024/collegescurricula/) for graduation in addition to those stated above for the major.

LAS majors require a minimum of 120 credits, including a minimum of 45 credits at the 300/400 level. You must also complete the LAS world language requirement and career proficiency requirement.

Students in all ISU majors must complete a three-credit course in U.S. diversity and a three-credit course in international perspectives. Check (http://www.registrar.iastate.edu/courses/div-ip-guide.html) for a list of approved courses. Discuss with your advisor how the two courses that you select can be applied to your graduation plan.

Biological/Pre-Medical Illustration, B.A.
120 minimum credits required.

Freshman

Fall	Credits	Spring	Credits	Summer	Credits
LAS 101		1 LIB 160		1 Prepare application for BPMI entry / apply during second year	
ENGL 150		3 Humanities		3 Consider taking a science course over the summer	
CHEM 163		4 BIOL 212		3	
CHEM 163L		1 BIOL 212L		1	
BIOL 211		3 ARTIS 230		3	
BIOL 211L		1 Soc Sci Choice		3	
DSN S 131		4 CHEM 231 & 231L or STAT or MATH		3-4	
		17		**17-18**	**0**

Sophomore

Fall	Credits	Spring	Credits	Summer	Credits
Foreign Lang. or Humanities (ART 280)		3-4 For Lang or Social Sci		3-4 Consider study abroad, or attending summer AMI / GNSI Conferences and enrolling in Art/ Science/ Techniques Workshops or Iowa Lakeside Lab to take advanced biology courses	
CHEM 231 & 231L or STAT or MATH		3-4 BPM I 326		3 Consider conducting BPMI 497 Internship over the summer	
BPM I 323		3 ARTIS 330		3	
ENGL 250		3 Humanities		3	

Science Core Course	3-4	Science Core Course	3-4	
LAS 203	1			
	16-19		**15-17**	**0**

Junior

Fall	Credits	Spring	Credits	Summer	Credits
BPM I 327	3	BPM I 337	3	Work with BPMI Advisory Committee to fine tune/plan senior portfolio	
Advanced Science or Science Core Course	3-4	Science Core Course or Advanced Science	3-4	If planning to attend graduate school, take GRE over the summer, or at the latest in the fall, and prepare up to 20 portfolio pieces for submission over the summer and fine tune in the fall	
ARTIS 308	3	Soc Sci	3		
Humanities or Social Sci	3	ARTIS 233	3		
Advanced Science or Art	3	Humanities and Advanced Art	3		
		Consider taking BPMI 491, Portfolio Design and Professional Development, to begin preparing for post-graduation steps			
	15-16		**15-16**		**0**

Senior

Fall	Credits	Spring	Credits
Advanced Science	3-5	Advanced Science	3-4
Advanced Art	3-6	Advanced Art	3-6
Humanities/ Social Elective	3	Humanities/ Social Sci/ Elective	3-6
BPMI 497	1	Advance English or Elective (ENGL 302 through ENGL 316 count as Advanced English)	3
Advanced English or Elective	2-3		
	12-18		**12-19**

Minor

A minor in biological/pre-medical illustration is offered. A minimum of 17 credits must be taken, including 8 credits in biological science courses and 9 credits in art and design courses. The minor must include at least 9 credits that are not used to meet any other department, college, or university requirement.

The biological sciences must include:

BIOL 211	Principles of Biology I	3
BIOL 211L	Principles of Biology Laboratory I	1

BIOL 212	Principles of Biology II	3
BIOL 212L	Principles of Biology Laboratory II	1

The art and design courses must include:

BPM I 323	Scientific Illustration Principles and Techniques	3
BPM I 337	Application of Scientific Illustration Techniques	3
Advanced drawing, illustration, electronic media or painting course		3

For more information, contact the BPM I advisor or view the website listed above.